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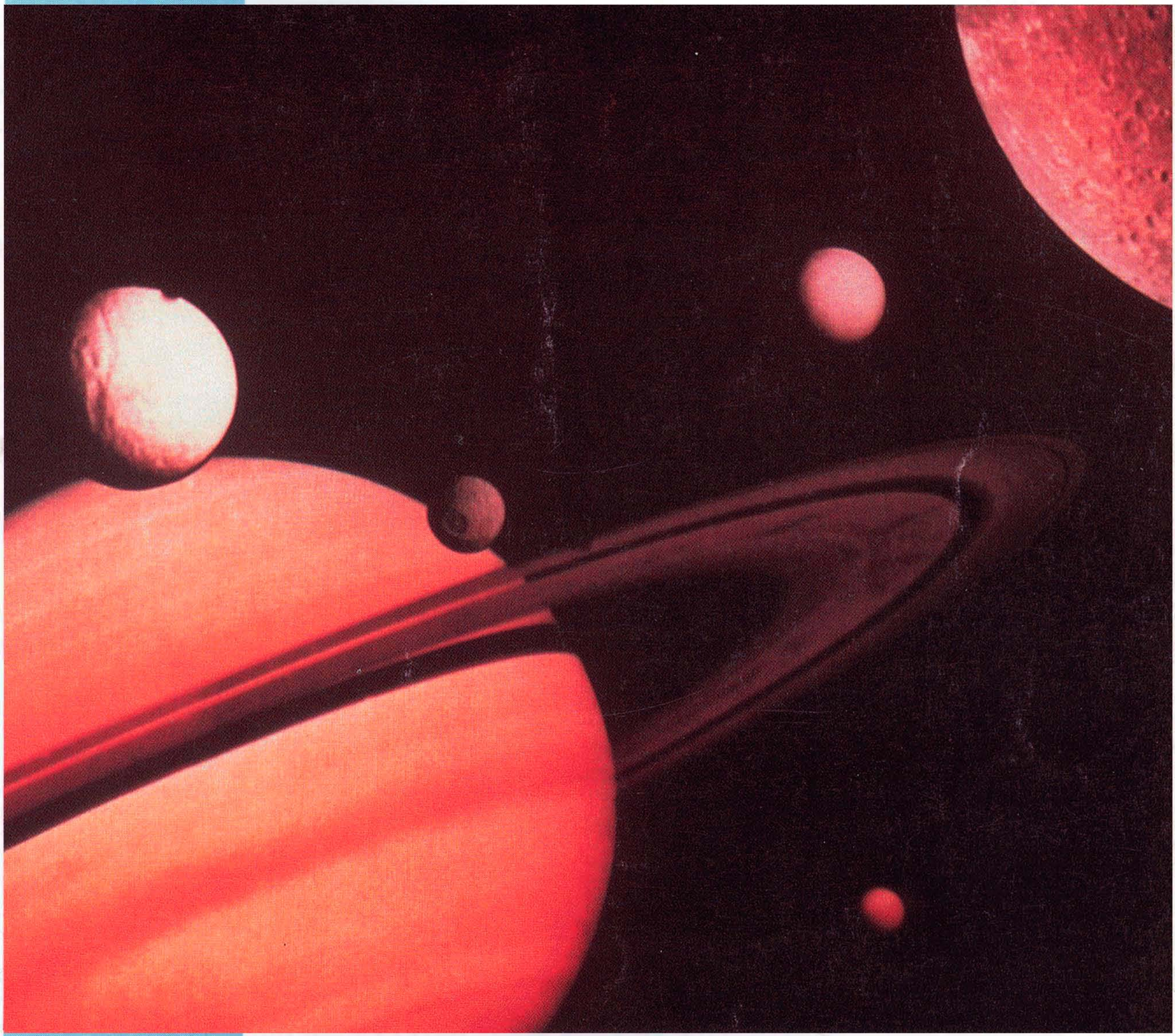

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Writing for Origins

Origins is looking for talented new writers, particularly those who have had experience in a specialised field of science or theology, in relation to creation, and who are in agreement with the aims and basis of the BCS. In addition, writers in a popular vein are needed, but accuracy and solid content are still essential. Any manuscripts for consideration should ideally be typed, double-spaced and sent to the Editor. Notes of guidance to authors are available on request. News items that may be of interest are also sought. We now welcome articles on disk in most formats, but 3½ " HD, Wordperfect 5.1 is preferred; media will be returned after transfer of the file.

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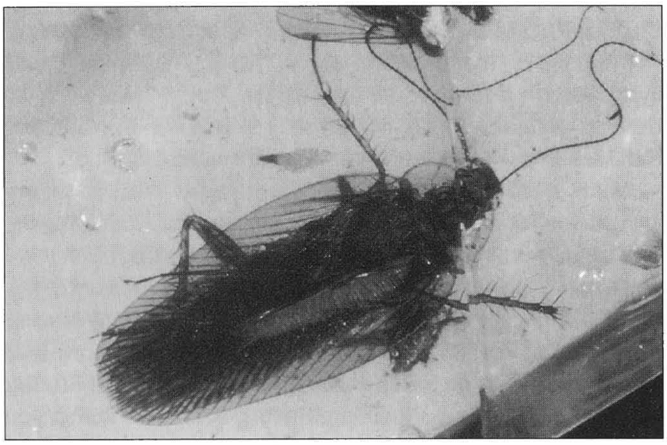
Editorial

DINOMANIA grips the nation! Dinosaurs have always fascinated people since their discovery, but demands for talks by creationists on this subject have increased in recent months. Our secretary, David Tyler, was invited to appear on a Channel 4 documentary, in particular to discuss the possibility of them being included in Noah's Ark and their subsequent demise.

One of the features of the *Jurassic Park* story was the extraction of dinosaur DNA in its blood which had been taken up by a mosquito, now embedded in amber. It is fascinating to see how amber has suddenly become popular amongst palæontologists. Our friend, Joachim Scheven, has collected and displayed samples for many years and a few years ago he gave a popular and well illustrated lecture on them for BCS in London. He has demonstrated that there is little evidence for change in these samples (which can vary from 40 to 100 million years old, on the evolutionary time scale, depending on the source) from modern specimens. How long does the evolutionist need to demonstrate a significant change if these samples do not display it?



It has often puzzled this writer why palæontologists are so absorbed by two-dimensional imprints in the rocks when we have access to these whole creatures. In fact, they have recently 'hit the headlines' in the scientific press with a number of books and articles. Two groups have published results on their study of DNA fragments extracted from such samples. These results do not seem to present data compatible with tens of millions of years of steady (or catastrophic) evolution.

We are often presented with data supposedly showing the evolutionary evidence available from DNA studies. For example, man has 98% genetic material which is common with the chimpanzee. So, we must be closely related! Perhaps it is time to raise a question: if we eliminated that 2% difference in a chimpanzee, would we end up with man? I am very sceptical about such an implication. The differences between man and his supposed distant cousins are far greater than 2%. It is materialistic to assume that all man's features are purely genetic. But, even if they were, is man (or any other creature) entirely coded in his DNA?

Sir Gavin de Beer, in his book, *Homology, An Unsolved Problem* (Oxford Biology Readers, No. 11), asks, 'Is the whole of development encoded in DNA (that is to say, in the genes)?' and responds, 'The answer in *Paramecium* is 'No.' Whether this is applicable to 'patterns' in higher organisms ... awaits further research.' Perhaps, as creationists, we need to be taking an initiative in this area of research.

In our main article, Brian Brady explores the genetic problems facing the intelligent breeder, leaving one wondering how a process depending on a non-directional concept can operate to produce a new kind of creature. In contrast, James Peet looks at the Genesis account and shows how he has found it to be a credible explanation of origins, in the light of modern observation and historical records.

To the evolutionist, man's closest relative is the ape. J. Kelso, in a book on archæology and the Bible, entitles his chapter, 'Man's closest relative is God.' Doesn't that thrill you? The Bible confirms his statement by declaring that men and women are made in the image of God.

We have been very encouraged by comments received verbally and in writing concerning *Origins.* We listen to adverse criticism as well as to praise! If there is a demand, we would consider including a question and answer section. In response to your questions, we would seek an answer from a suitably qualified creationist.

J.H.J.P.

Creation in the News

CiS Conference at Regent's College

A report from J. H. John Peet

CHRISTIANS in SCIENCE is a branch of the Universities and Colleges Christian Fellowship which seeks to bring together evangelical Christians with scientific qualifications. Though a number of Special Creationists are members, it does appear that the majority are Theistic Evolutionists.

On 2nd October 1993, CiS organised a conference at Regent's College, London. About 140 attended the conference which was generally conducted in a friendly, Christian atmosphere. This was undoubtedly due, in part, to the chairmanship of Dr. Oliver Barclay. Probably the saddest part of the day was when one speaker had to resort to a caricature of creationists in general based on his experience with one. I have been involved in this work for many years and not yet had this experience. It does not help dialogue and a seeking after truth to resort to this approach. I exhort creationists as well as evolutionists to avoid unfair characterisations.

The papers presented covered a variety of relevant topics: theology, biblical exposition, geology, environment, the origin of plant species and a couple of philosophical papers. The intention was that the papers should be read in advance and then the speakers questioned and discussions arise from them. Unfortunately (as far as I am concerned) Dr. Barclay produced his own agenda of questions after the first couple of papers, preventing an in-depth discussion of some of the issues presented.

Professor Paul Helm presented the theological paper and made it clear that absolute creation was beyond scientific research because, by definition, it was before time. The paper by Dr. Gordon Wenham on Genesis was disappointing. It was based on the thesis that the purpose of the documents was to counter other ancient near eastern mythologies and not to present historical truth. What is not clear is what evidence Wenham had for this approach. The Bible itself presents a different purpose for its writings and there is little evidence that the Genesis record was ever read by these other nations.

The geological presentation was by Dr. Ted Rose. His main thesis was a challenge to the Biblical presentation of creation which conflicts with the fossil record. We agree, but that is not what we claim to be the point of correlation as any reader of our papers by Garton or Scheven will be aware. The rocks are a record of extinction, not creation. So, he was knocking a false model of creationism.

Perhaps I was naive, but I did think that, for a change, Prof. Sam Berry and I could be on the same side when he spoke on the environment. We have a united front here, but, unfortunately, evolutionary theory had to invade once again.

Discussions did not follow from the other papers, which was a pity. Nigel Hepper's paper indicated the problems of the species concept and this could have been another profitable area of discussion. Mr. Hepper insisted that macro-evolution is simply the sum of micro-evolutions and there is no distinction to be drawn between them. Dr. Bob Carling concentrated on some philosophical implications of evolution by natural selection and threw in some issues for creationists as well. He included a sympathetic reference to Dr. Arthur Jones's challenge to theistic evolutionists in *Origins*. This was a helpful paper that deserves more attention by both sides.

Mike Poole presented the final paper which was a critique on Richard Dawkins. Again a valuable contribution.

The day was not structured as a debate and there is no way of saying anyone won or lost. Different people will have differing views of the value of the day. We were encouraged at the amount of literature bought from BCS and even had some joining the society, for which we thank God. It is a thankless task organising such a day and you cannot please everyone. However, it would have been fairer to have had speakers presenting the creationist position—after all, a number of us are members of CiS—or does CiS want to present itself as an evolutionary organisation?

The Credibility of Genesis 1 & 2

James H. Peet

THE FIRST TWO CHAPTERS of Genesis are critical as the foundation of doctrine and interpretation of all the Bible. Orthodox Jews, like the Christian churches for 18 centuries, believe they were recorded by Moses, the great Jewish leader and prophet of the fifteenth century BC. Modern critics generally ascribe the writings to a priest of about the sixth century BC. The Dead Sea Scrolls seem to imply that 500 BC is the latest date and it is possible to infer that they were written long before that date.

In this paper we review the Genesis record and ask whether it is credible. It is a different approach to the subject from the usual one, but relevant. The views are personal ones which the author has found helpful and exciting as evidence of the reliability of this section of the Scriptures.

The Writer

We need to consider what the text indicates of the character of the original writer in order that we may assess his credibility. First, we must notice that the only sources of information beyond his statement that it was God (Genesis 2:4) were the legends of Babylon, Egypt, Sumer and the Hindus. These accounts are fabulous and fantasy in their content. A goddess quarrels with her husband-god and, in temper, cuts a ball of wool in half, one half becoming the heavens, the other the earth. Or, the earth is like a plate and rests on the back of four elephants. An unbiased reader cannot imagine that the writer of Genesis could have drawn his ideas from such contemporary accounts. We see him as a distinctive, intellectual master.

As we read his account, we see a precise mind and definitive logical argument and progression. Each form of life comes once provision has been made for its support. Immediately trees and grass have been planted (1:11 and 2:5), special provision of light and heat for their growth is created (1:14). So, even if it is not true, we have a credible scientific pattern. The author was a man of intelligence and scientific perception. Else, his source must have been authoritative.

We need to consider also his attitude to his subject. A useful comparison is that of the New Testament writer, John. His gospel begins: 'In the beginning was the Word and the Word was with God and the Word was God.' John is saying that there was a time when there was only God and explains something of the nature and action of this God. The Genesis writer uses the phrase, 'In the beginning' (though the Hebrew omits 'the'). So, he writes, 'In beginning, God created.' He makes no statement about the character of God. He assumes that God exists and that, in the infinite space into which modern astronomers see the visible universe constantly expanding, beyond all our comprehension, was God. The first thing God did was to create this visible universe. There is nothing less credible in this statement than what is involved in posing the necessary condition to produce the 'Big Bang.'

The Hebrew writer parts company in his interests from some modern scientists. Vast time, thought and sums of money are spent in investigating the origins and nature of 'the heavens.' After stating that God created them—the Hebrew word *bara* means 'created out of nothing' as Psalm 33:9 indicates—the writer has no more to say about the universe but concentrates on the earth and the solar system which affects it. The implication is that he has no information about space and, by inference, he believes what he is saying about the earth is factual information. He is an honest recorder of information available to him. The Director General of the Armagh Observatory suggested on BBC (Songs of Praise, 6 January 1991), that we may suppose that the eternal God would not have been inactive in the timeless ages before Genesis 1:2 and that, during that period, He created those stars which are estimated as being thousands of light years away.

The Record

Moses describes a sequence of events spreading over six days. We are not to understand that it took a whole day (let alone billions of years) for God to mould the sun and moon, or a whole day to make all the fish *etc.* The word of Psalm 33:9 applies here. On the first day, God spoke and, in a flash, there was light. On the fifth day, God spoke and (to use the words of Paul on another matter) in a moment, in the twinkling of an eye, the waters teemed with fish.

So, first he states the condition of the planet earth at the moment it is created. The Hebrew words *tohu* and *bohu* indicate a shapelessness and emptiness (Fields, 1978). It was devoid of life. The globe was totally covered with water.

He then states that the Spirit of God moved upon the face of the waters. What sort of movement this was, we are not told, nor the effect of this movement. No time scale is given for these events nor for the length of time before they occurred. Similarly, the age given for Adam's life may date from his becoming a dying man through the Fall and not from his creation. The earth was to undergo traumatic changes wrought by the Fall (Genesis 3:17–19). This event seems to have affected the courses of the main rivers of the Middle East (2:10–15). In 1852, the Hwang-Ho river in China flooded thousands of square miles, drowned a million people and shifted its course 300 miles (Lake, 1958a). Similar effects have been observed with the Yangste-Kiang. If this is the effect of a local flood, how much more would be the effect of the Noahic Flood on the geological structure of the whole world? So, we cannot expect to define the geography of the earth in Genesis 1:3.

At this point, the writer begins to specify actions by which God prepared the world for habitation by a creation which was imagined in His mind (1:25; 2:7–8, 15). Archbishop Ussher, at the beginning of the seventeenth century, calculated (from the reigns of the kings and the ages of the patriarchs) that these events happened in 4004 BC. This agrees closely to the Jewish dating of creation. However, the Samaritan Pentateuch gives longer periods for the ages of the ante-diluvian patriarchs which make the age of creation 10,000 years ago. This compares well with the calculations of some geologists that the coral islands in the Pacific began to be laid about that time. Also, it is claimed that the Northern Ice Age ended at that time (Manley, 1970). A big melt began about 10,000 years ago. Perhaps this may have been a partial cause of the Noahic Flood.

Experiments conducted by Cousteau in 1965 showed that coral grew 96 cm in three years (Roads, 1969). A bore in Bikini in 1947 found a thickness of 2,556 feet, then, after a break in the coral of 75 feet, a further 1,135 ft was found (Lake, 1958b). At the above rate of growth, it began to form 9,000 years ago. Measurements at Eniwitok Atoll give a similar age (Stoddart, 1971). But, we may bear in mind the uncertainty mentioned above of the significance of the age given for Adam, which allows for a greater age for the creation.

On the first day, we read of the creation of light (1:4). It must be remembered that the subject of the record is entirely the earth and not the universe in general. This light did not originate from the sun as this was not created until the fourth day. The pictures taken by astronauts show the earth bathed in a blue fluorescence which is both beautiful and unique in the solar system. It has been noted that the portion of the planet which is not illuminated by the sun often shines with a phosphorescent light of its own. As long ago as 1803, Rozier and Beccaria observed luminous mists. The writer of Genesis could not have known this by scientific observation. But, he gives a credible account of such a happening.

The second day is marked with the formation of a layer which lifts a depth of water from the terrestrial sphere to some distance higher. No explanation of its nature or purpose is given. No comparable incident is recorded in any other legend or myth. There is no reason for it to be related if it were not true. The writer records it as a fact of which he was informed although he has no other particulars of it. He does not attempt to speculate on these matters. This marks him as an honest narrator of good credibility. He had no means of knowing, as we are aware today, of various bands surrounding our earth reflecting radio waves or with other facts, including the famous ozone layer. So, the firmament is a credible idea.

On the third day, two things are executed. First, the elevation of the rocky plates of the earth's crust above 'sea level' and the consequent sinking of the terrestrial waters into the subsidences around them. This action leaves the condition of part of the earth as suitable for receiving plant life (1:11–12). It does not say that God planted seeds but fully grown trees, bushes and plants (2:4–5). Studies in the rain forests, particularly in Brazil, show that these cannot develop from immature copses. They always have to have been there as thick forests. Cut them down and they cannot regrow (Harris, 1968). Had the writer of Genesis suggested that plant life originated from seed, his account would have been susceptible of error. However, he declares that God planted the trees fully grown.

The record now says that on the fourth day, the sun and moon were created, with the specific purpose of controlling the temperature of the earth, providing alternating times of light and dark. This is necessary for the growth processes of the plants just created. Added information is given in 2:6, that there was no rain at this stage, the earth being irrigated by the dew. This could happen only if there were solar activity. Had there been any great time period between the creation of the plants and the sun, the vegetation would have withered. The humblest gardener knows the effect on his lawn and flower beds of dull skies or drought. Herschel stated that within three days from the extinction of the sun, there would, in all probability, not be a vestige of animal or vegetable life on the globe.

In 48 hours, there would be a universal frost of 200°C or more below zero. No vegetable could resist that even for an hour. So, only a short time could have existed between days three and four.

In 1901, the Astronomer Royal, Prof. Piazzi Smith, pointed out a significant factor. The earth's course around the sun is an ellipse, the points of greatest and least distance from the sun marking the equinox and solstice. The solstice fall on the 21st December and 21st June. The spring equinox falls on the 21st March. One would expect an equal distance, therefore, between the summer solstice and the autumn equinox as between these other points. However, the autumn equinox falls on 23rd September, making a difference of four days. This could be accounted for by the creation of the sun when the earth was on the fourth day of its eliptic orbit (Dimbleby, 1902).

Remember that the point of this analysis is not to prove that the account is accurate, but that it is credible. If the universe was created by an onmipotent and ominiscient God, it could reasonably have been created in this way. If it is a correct record, it is consistent with our present knowledge of natural science. In all this, the author is an honest, intelligent man and did not invent his story but must have had a reliable source. It should not be the object of disparagement and careless rejection.

With the fifth day, we come to the creation of the fish, aquatic mammals, sea creatures and wild birds. The chain of life from plankton to whales is simultaneously established. It is a practical necessity, for each species has its natural source of nourishment and this is abundantly available to allow for reproduction without the need of animal husbandry. This provision is made in the account. The premise of slow evolution creates difficulties as to how this need could be met. Many wild birds feed upon fish, on plant life from trees, bushes and grass seeds. For the others, we move to day six.

On the sixth day, the terrestrial creatures are made. These include insects and rodents, which complete the food web for the carnivorous birds.

The next statement is that man and woman were made in the image of God. As the doctrine of the Bible is that God is a spirit, without visible appearance to man (1 Timothy 6:16–17), there is much argument as to the meaning of the word 'image.' A reasonable interpretation is that man has qualities not possessed by the previous creatures but attributable to God: morality, high intelligence, conversational communication and similar qualities. However, this writer suggests that the word is meant in the sense in which we use it as the concept that an author, poet or artist has in his mind of a work he is going to produce. In the divine mind was the image of a creature superior to all He had yet made (Psalm 8:4–9). Man was made in that image.

Then God lays down the ground rules for His creation. All that He had made needed care and support (2:5). This He commanded man to provide. The word 'dominion' is to be understood in its original root use, *domus*, the care and love of a family home. When man is given dominion, it means much of what the modern 'green,' 'wild life,' 'environmental' groups are asking for.

Finally, fruits, nuts, vegetables and grain are appointed for the sustenance of man, terrestrial creatures and birds.

Genesis 2:4 states that 'These are the generations ...' The term 'generations' is so used thirteen times in Genesis and is equivalent to the modern conception of a work of art being the child or mental offspring of the artist's brain. The generations of the Lord are the narratives of the Lord. So, the writer claims that all that he has written before (2:4) was told him by God. If one believes in God, this makes complete sense and veracity. It adds to the credibility of the writer as they are the things he could not have known or discovered in any other way. If there is no God, the writer is mistaken but he remains a credible writer in as much as he has given a consistent and intelligent account.

With Genesis 2:4, there begins what appears to be a parallel account of the events of day six. The phrase 'generations of Adam' suggests that this section of the account was first related by Adam, who would be in a position to know these things. Some interpreters suggest this account contradicts the relevant part of Genesis 1, but it is possible that it refers to separate facts. The main divergence is in v. 18–28, where the beasts and birds are different from those in chapter 1. It is stated that Adam gave names to all those creatures which were created for his companionship. The fact is that this second list refers to domesticated animals (like horses, llamas, dogs and cats), to farm animals (cattle and sheep) and to domestic fowls (hens, ducks, *etc.*), as distinct from those that fly high above the earth. These are the creatures that God made for close partnership with man as distinct from 'wild animals' that would roam away from him. Adam is unlikely to be able to name the thousands of species created in Genesis 1. It is not only possible but appropriate that he should name those who would be his companions. It was only these that were created after man on day six (Genesis 2:18–22).

Some significant points

In recounting the origins of *Homo sapiens*, God made four significant statements which Moses faithfully records.

First, there was an important difference in the creative act for man. All other creatures were created out of nothing by the Word of God (John 1:3; Hebrews 11:3). But, in the case of man, God takes the soil which He has already created and moulds it into the image He has divinely conceived. This is important to our argument because it is an unlikely development in a fictitious account. The narrator would not change the mode of creation so drastically without a rational reason or motive. There is no reason arising from the text, so we must assume that the writer had a credible source of information.

The second significant feature is the statement (2:7) that God breathed into him a soul. Nothing like this is recorded for the animal creation. In Deuteronomy 6:5, Moses distinguishes between the sources of human energy—the heart, which in his culture was the basis of physical life (Leviticus 17:11)—the skeletal and fleshy structure and the soul (the source of emotion). It is apparent that there was a vital difference between men and all other moving creation: man had a soul, whatever that is, specifically imparted by the Creator. All religions apart from the three that accept the Old Testament in some way, identify humans so closely with the animal world that their gods are either animals or part animal and part human, or they are personifications of celestial objects or elemental forces. In pagan religions, the gods often indwell the animals. This constituted a philosophy of life and origins which makes the Genesis record of man's creation unique. The author had an understanding of facts which was totally free and different from human concepts. His statement is daring and challenging to a point of conviction.

The third significant point inserted into the account by the author is that God created man with a specific purpose of maintaining the plant life of the earth (2:5, 15). The idea has interconnected purposes. Although this is before the

Fall, so there was no difficulty from weeds, thorny growth and general degrading of vegetable life, there was a necessity for good horticultural service in pruning, grafting, giving supports and general tillage. Man was needful for the completion of God's beautiful and all-good creative purposes. Nowhere else in the history of myth, legend or philosophy is man so viewed. It is viewed as part of an intelligent plan. The author has a credible approach as an informed writer.

The fourth aspect developed is the conscious mind of man for a closer form of companionship than that the most familiar animals can afford: a higher level of communication. For this, God provides the woman—a helper suitable to man, one so like him that they can converse on the same intellectual level, share the same emotional capabilities. This closeness was like the closeness of Siamese twins. The creation of woman was for spiritual—*i.e.* more than merely emotional or intellectual—companionship. This is a special concept and, while Plato infers the existence of mutual companionship, this is a most unusual concept. The word 'help' (Hebrew, *ezer*) is used, for example, in Ebenezer (1 Samuel 7:12) where it refers to God as a help to His people. Woman was a complement to man's needs, a source of communion in things which the soul-less animals are not. This explanation of the origin of woman exalts her above the universal attitude of males to women, outside the practice of Christians and Jews, the people of the Bible.

The implication is that the author has a unique concept of womanhood and bases it on an extraordinary account of creative activity. He is obviously a man with a confident reliance on his source of information and a credible witness. It is obvious that the intention is that the woman, although physically different for purposes not yet considered, should have a deeper relationship, intimacy and empathy with the man than a separate creative act would give. After the first creation, Adam and Eve passed on a united genetic seed which meant that all subsequent men and women had this common bond. Hence the emphasis on Eve being the mother of all living (3:20). So we get the Judeo-Christian emphasis on the Biblical view of women and on the sanctity and permanence of marriage and rejection of pre-marital relationships.

The sum of this discussion is that, aside from the issue of the accuracy of the account of creation in Genesis 1 and 2 (though the present writer does not doubt this), it is rational and the author is a credible narrator.

References

DIMBLEBY, J. B. (1902) *The Date of Creation*, E. Nister, London.

FIELDS, W. W. (1978) *Unformed and Unfilled*, Presbyterian and Reformed, Pittsburgh.

HARRIS, D. (1968) *Venezula's Empty Rain Forest*, Geographical Magazine, 41(3), 216–220.

LAKE, P. (1958) *Physical Geography*, (a) 306; (b) 203; (c) 139.

ROADS, C. H. (1969) *Quest in the Red Sea*, Geographical Magazine, 41(7), 524–529.

STODDART, J. R. (1971) *Variations on a Coral Theme*, Geographical Magazine, 43(9), 610–61

THE AUTHOR

James Peet is a retired pastor and teacher of history and geography. He is a graduate of the Open University. For many years he has been involved in youth work and encouraged a belief in Biblical creation and a rejection of evolution.

Vast Diatom Mats in the Miocene–Pliocene

Readers will be aware that authors in this journal and elsewhere have argued that the centuries immediately following the Flood of Noah were times of great ecological and geological instability. The earth was still reeling from the greatest catastrophe it has ever endured, and life was beginning to re-establish itself, as evidenced by the ecological successions of the Mesozoic and Cænozoic.

An article in a recent edition of *Nature* (11 March 1993) provides further evidence that conditions in the geological past were often quite unlike anything in the present day. Alan Kemp of Southampton University and Jack Baldauf of Texas A&M University document the existence of vast mats of the diatom *Thalassiothrix* in Miocene–Pliocene sediments of the eastern equatorial Pacific Ocean. Diatoms are unicellular creatures which, in this region, formed mats which can be correlated for distances of more than 2000km! Kemp and Baldauf express a certain amount of surprise that these laminated biogenic sediments were preserved at all. Current models explain the preservation of such laminations as the result of insufficient oxygen in the water to support biological activity which might disrupt the laminæ. However, examination of the laminated sequences has shown no increase in microfossil species characteristic of a low oxygen environment. The authors conclude that 'the strength of the mats and the scale of their deposition may have overwhelmed the benthos (= seafloor community), so that the laminations were preserved by physical means' (p.141).

This paper highlights once more the fact that there is often a discontinuity between modern and ancient processes and environments, and will thus be of relevance for those interested in the development of creationist models of earth history.

P.G.

The Breeder's Nightmare called 'Natural Selection'

Brian A. Brady

DR. RICHARD DAWKINS, in the 1991 Christmas lectures of the Royal Institution, correctly asserted that such obviously designed objects as microscopes and telescopes could never have formed by chance, not even in ten thousand million years. Yet he also asserted that such infinitely more wonderfully designed objects as owls, eagles, bats, stick insects, cabbages, *etc.* needed no designer; and that the all-sufficient explanation for their origin is the working of natural selection.

Now, we know that not even the cleverest human being (nor even 5,000 million of them working together) could have designed and created the very simplest of living organisms—not in 15,000 million years. Yet Dawkins asserted that blind chance and natural selection achieved the impossible in producing every form of life on earth. Not only so, but natural selection was such an efficient designer and creator, accomplishing its astounding feats with such ease, that it could, and did, 'solve' the same problem over and over again. Thus natural selection could, and did, come up with a great variety of 'solutions' to the problem of the design of the eye, such as is found in the squid, scallop, spiders, and the compound eye of the insect. Dawkins said that 'the same principle was hit upon independently' many times over by natural selection.

Thus, what 5,000 million people like Dawkins could not accomplish in 15,000 million years was accomplished with consummate ease, and without a designer, by the miraculous power of natural selection! We would enquire, then as to what this 'natural selection' is, and try to discover how it is that it has such miraculous power.

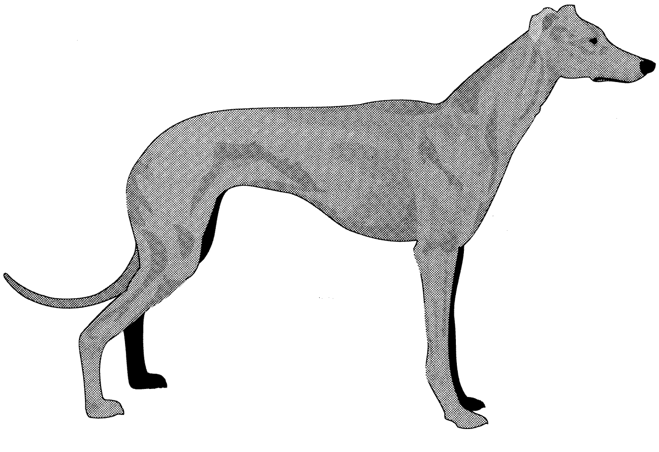
What Natural Selection is and does according to evolutionary theory

Natural Selection means the elimination, from further breeding, of all the individuals in a population which are disadvantaged in any way, such as through being slow, weak, dull-witted, blind, lame, sick, ill-adapted, *etc.* The forces that weed them out and eliminate them (the supposed 'selection pressures') are such things as competition for scarce food and habitat, predation, disease and a harsh environment, *etc.* The individuals that survive all these pressures and are left in the population have thus been 'selected' naturally to breed the next generation. Thus the genes of the 'cream' of the existing population get passed on to form a new generation having all the 'favourable' genes of the ancestors, with all the 'unfavourable' genes of the disadvantaged not having been passed on because they were eliminated. In this way, over time involving many generations, all the 'good' genes, which were originally uncombined in any one individual but divided out among many separate individuals, came together, to be combined in a single individual (or pair of breeding individuals) thus creating or evolving an improved, more 'advanced' organism than existed previously, possessing new features like eyes, limbs, *etc.* That is the secret of the evolution of species through natural selection.

The claims of the evolutionists

But this explanation of evolution fails to account for the creation of, say, such complex organs as the eye or the brain. Natural selection cannot select what does not exist. Such organs must come into existence either by creation or chance. As the evolutionist Professor William Howells (1967) puts it,

> 'Where do "new" features, or eggs, or eyes, come from? For it once was a common objection to Darwinism that selection explains the survival of the fittest but not the arrival of the fittest; that selection eliminates but does not create.'



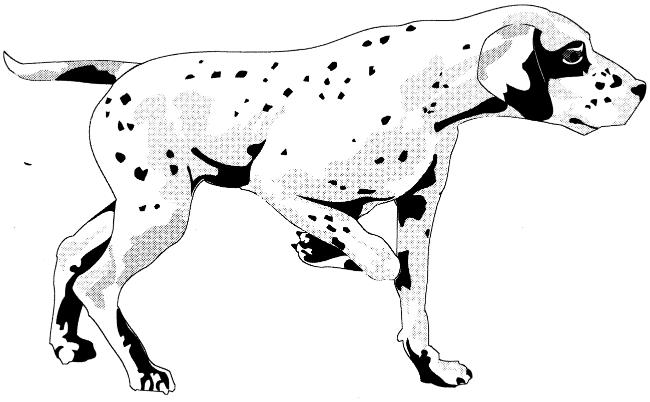
But Howells then does go on to make the unbelievable assertion that natural selection does create new features.

According to evolutionists, new features like limbs, wings, eyes and eggs, *etc.*, are supposed to develop gradually as a result of the separate contribution of myriad minute random changes in heredity, called 'mutations.' Natural selection then selects and combines those mutations that favour the development of advantageous new features. Thus, new features like eyes are ultimately formed purely by chance—by random mutations occurring separately in different individuals. But natural selection speeds up the formation of the new feature by bringing together in one individual (by selective breeding) all the scattered bits of 'favourable' development appearing in many separate individuals.

On the face of it, all of this sounds exceedingly improbable and implausible. But then, this is how the evolutionists explain it all:

> 'One other thing, basic but often overlooked, is the fact that the species, or population of animals, undergoes its evolutionary creep together, advancing here, catching up there. It is never a case of a single individual appearing in strikingly new form and fathering a sort of secession from the old type in one generation.' (Howells, 1967)
>
> 'The earth's modern organisms have some 4,000 million years of history behind them, during which evolution explored innumerable blind alleys. Every large, advanced creature is the product of literally thousands of millions of mutations, most of them imperceptible, which had the effect of giving the creature's ancestors, age after age, a survival advantage over their competitors. ... Many evolutionists believe that if the primitive earth were to evolve life all over again, there would be no appreciable chance that an animal physically resembling man, or even any of the mammals, would evolve. ... The statistics are strongly in favour of life.' (Life Science Library, 1966 & 1967)
>
> 'Many will be puzzled about the statement that practically all mutant genes are harmful. For mutations are a necessary part of the process of evolution. How can a good effect—evolution to higher forms of life—result from mutations practically all of which are harmful? First of all, it is not mutations which of themselves produce evolution, but rather the action of natural selection on whatever combination of genes occur. ... Nature had to be rather ruthless about this process. Many thousands of unfortunate mutations, with their resulting handicaps, were tolerated, just so long as an advantageous mutation could be utilized, once in a long while, for inching the race up to a slightly better adjustment to the existing conditions. The rare creature with an advantageous combination of genes was better fitted to survive and displace his less favoured companions, and thus evolution was served, even through there were thousands of tragedies for every success.' (Anon., 1956)

These accounts bristle with thorny problems for the theory, but in particular, we see the extreme difficulties under which natural selection is labouring, and yet supposedly succeeding!



Howells, in his book, speaks of the 'stock of genes' held collectively by the whole group of individuals, but not held in its entirety by any one individual. In the population as a whole there is 'the constant churning and shuffling of the great mass of genetic material already present,' with 'the slow selective adoption of occasional new, favourable mutated genes'—presumably to form some new feature. The emphasis is on the extreme range of diversity as well as the fine degree of gradation of differences in the population; so much so that it would be hard to single out any one individual as being truly representative of the 'species.' As Dr. Michael J. Kenny (1966) puts it:

> 'If evolutionism teaches us anything, it is surely that species are, in the long view, little more than "resting places" in a continual process of change. In fact, as we have seen, evolution is not necessarily synonymous with species formation at all, for the processes of variation and selection which are accepted as underlying organic change can go on without speciation.'

So let us picture the dog as we know it when it was trying to evolve from its beginnings as a mere 'dog's body' of a creature without any legs, paws, coat, tail, head, eyes, ears, teeth, tongue, *etc.*, and having to 'solve' the problem of how to evolve those features in order to become a dog. From what we have just been told, 'evolution explores innumerable blind alleys.' Among those blind alleys there must have been the animal with only one leg, or four tails for legs, or with eyes on the soles of its feet, or teeth in its backside instead of in its mouth, *etc.*, until evolution was able to come up with the 'correct' solution.

Dawkins, in his Christmas lectures, tried to make it seem plausible that the 'mistakes' like these were better than nothing. Howbeit, if evolution happened that way, we should see the 'fossil record' littered with a myriad of these 'blind alleys' and 'tragedies' and 'wrong solutions'—so much so that trying to find a clear-cut example of a species among them would be worse than looking for the proverbial 'needle in a haystack.' And not only so, but since evolution is supposed to be always going on apace, even today before our very eyes, as Kenny has asserted, we should be seeing this same utterly chaotic state of affairs existing in the living world today! But, since there is a total absence of proof of any such thing, either in the fossil record or in the living world, we could hardly have a better denial of the theory of evolution so far as necessary visible evidences are concerned.

But we will go on now to refute the theory on theoretical grounds. Since natural selection as defined by evolutionists is all about selective breeding, we will look into the fatal problems besetting such natural selection.

Natural Selection is all about selective breeding, and is itself fatally subject to the workings of chance

The famous evolutionist, Professor Julian Huxley, has described the workings of chance through natural selection as 'a mechanism for generating improbability of a very high order.' Presumably he means the exact opposite of what this highly ambiguous statement appears to be saying; *i.e.* that natural selection is a mechanism for making the extremely improbable event become highly probable. He says (Huxley, 1946),

> 'Let us assume that the improbability of a favourable mutation extending, without selection, to all the individuals in a species is a million to one (a very low estimate, by the way). Then the improbability of two such favourable mutations extending through the species is a (British) billion to one. With ten separate mutations, the improbability becomes astronomical: yet we know that by artificial selection, man has been able to combine many times ten favourable mutations to produce the fowls or horses or wheats he wants.
>
> It is improbable in the highest degree that the human eye should have arisen "by chance," but with the aid of the machinery for producing improbabilities provided to life by Natural Selection, the improbability can be and had been actualized.'

Huxley here states the enormity of the statistical barrier opposing the chance formation of just one complex organ as, say, the human eye; and claims that the powerful 'anti-chance' mechanism of natural selection has overcome that barrier. It is easy to see the fatal flaw in this reasoning, which is that natural selection, as it has been defined, has got to defeat its own equally great statistical barrier. Other evolutionary writers recognise the problem, only to dismiss it again in the most perfunctory manner. Professor Ernst Mayr (1978) says about it,

> 'At first many rejected it (Natural Selection) because it was not deterministic, and hence predictive, in the style of 19th-century science. How could a proposed "natural law" such as natural selection be a matter of chance? ... Those who rejected natural selection on religious or philosophical grounds or simply because it seemed too random a process to explain evolution continued for many years to put forward alternative schemes with such names as orthogenesis, nomogenesis, ...
>
> As for the objection to the presumed random aspect of natural selection, it is not hard to deal with. The process is not all a matter of pure chance. Although variations arise through random processes, those variations are sorted by the second step in the process: selection by survival, which is very much an anti-chance factor' (*Evolution*, Scientific American, September 1978, pp.42,43).

Huxley speaks of a favourable mutation spreading through an entire species almost as if it were spread in the manner of an infectious disease. The problem needs restating: What is the probability that a single favourable mutation will become fixed in a pure-breeding male/female pair so as to be passed on to all of their descendants to form an entire population possessing the favourable mutation? And the next question is: What is the probability that several separate favourable mutations will become combined and fixed in a single pure-breeding male/female pair so as to produce from them a population in which every individual has inherited all of those favourable mutations?

It goes without saying that, even with the most efficient use of selection, it would become impossible to try to breed into a stock too many new features or characteristics all at the same time. (To start with, the individuals doing the breeding would not be able to produce offspring in the large enough numbers that are required). So the notion of being able to combine, in one simultaneous breeding operation, a myriad of minute, imperceptible favourable mutations carried separately by as many separate individuals in the population, is a complete non-starter. They could not all be bred-in simultaneously, but would need to be bred-in successively, one—or at most two or three—at a time.

Mendel's laws of heredity explain how a newly appearing characteristic can be bred into a pure-breeding male/

female pair; and also enable us to calculate the probability of having success in such a breeding venture whenever the element of chance enters into it.

Mendel's laws of heredity illustrated

We will use an exaggerated example of a 'new favourable mutation' in order to illustrate the workings of Mendelism in a particular case.

If the new favourable mutation was the sudden appearance of, say, a pair of perfectly good seeing eyes in a newly arrived individual of a population, when none in the past had ever had either eyes or sight, then, in Mendelian terms, the 'factor' for eyes and sight would be denoted by the capital letter 'E.' Similarly, the factor for not having eyes would be denoted by the small letter 'e.' If this new factor first appeared in a male, this type of male would be designated as genetic type (1), thus:

E X
e Y

where the 'X' is a factor that both males and females possess, and the 'Y' factor indicates a male, because only males carry this factor. This male would then be crossed with a female lacking the new factor 'E,' and the female would be designated as genetic type (2), thus:

e X
e X

where the lack of the 'Y' factor and the possession of two copies of the 'X' factor indicates a female. This pair would then produce the following four types of offspring in equal numbers:

Type (1)		Type (2)		Type (3)		Type (4)
E X e Y	+	e X e X	+	E X e X	+	e X e Y
Male with eyes		Female without eyes		Female with eyes		Male without eyes

In the first-generation offspring, types (1) and (3) would both have eyes and sight through having the factor E, and so they would be 'selected' to breed the next generation. But both of these types are not pure-breeding for eyes and sight because they each carry only one copy of the factor E in their genetic make-up. Each also carries one copy of the factor e, which does not produce eyes in the absence of the factor E. A pure-breeding type would need to carry two copies of the factor E.

So then types (1) and (3) would next be crossed, producing the following six genetic types of second-generation offspring, with the numbers of each respective type being in the proportion; 2:1:2:1:1:1.

Type (1)		Type (2)		Type (3)		Type (4)	
E X e Y	+	e X e X	+	E X e X	+	e X e Y	+
Male with eyes		Female without eyes		Female with eyes		Male without eyes	

Type (5)		Type (6)
E X E Y	+	E X E X
Male with eyes		Female with eyes

Pure-breeding

The genetic types (5) and (6) produced in the second-generation of offspring are now pure-breeding for eyes. But would they alone be 'selected' to breed the next generation?

The problem in selecting them is that they would be indistinguishable from the impure-breeding types (1) and (3). This means that there would be only 1 chance in 9 that types (5) and (6) would be mated together to produce a population in which the favourable mutation for eyesight would be certain to extend to all the individuals. Therefore, even with the most efficient use of selection, there is only 1 chance in 9 that a pure-breeding stock for eyesight would be established in the third-generation offspring. Without selection at each generation, there would be only 1 chance in 4 x 16 = 64 of success after completing the third generation cross.

If we were considering combining simultaneously two favourable separate mutations (say, the sudden appearance of eyes in one individual and of wings in another, the one male and the other female), we would find the corresponding probability of success that much smaller. We would then denote the factor for wings by a capital W, and the factor for not producing wings (in the absence of W) by a small w. The two types to be mated in the first cross would then be designated in Mendelian terms as male genetic type (1) thus:

w	E	X
w	e	Y

and female genetic type (2) thus:

W	e	X
w	e	X

Cross-breeding would then continue until, hopefully, in the third generation, the pure-breeding male and female genetic types,

W	E	X
W	E	Y

and

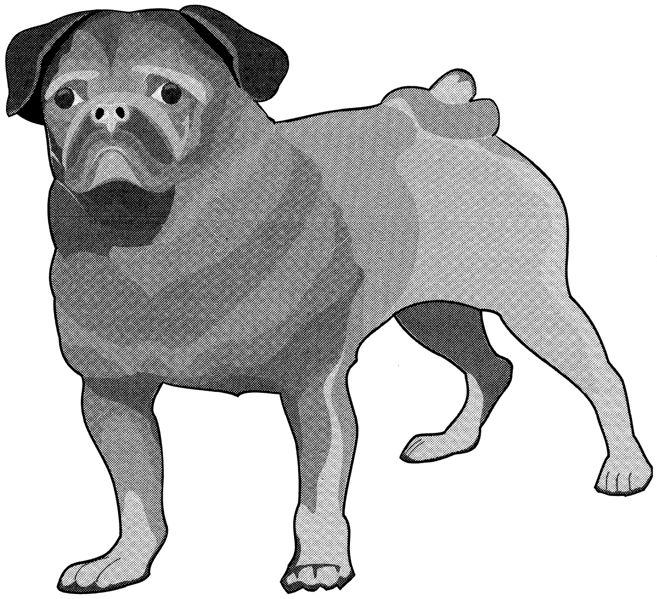
W	E	X
W	E	X

would be mated together to produce a population in which the two favourable mutations for eyesight and wings would be certain to be combined and fixed in every individual. With selection at each generation, the probability of final success would be 1/81 and without selection it would be only 1/4096.

However, when natural selection is supposed to be fitting together the myriad of tiny bits of the 'genetic jigsaw puzzle' which will make up the new character (brain, eye, heart, *etc.*), we are told that the mutant individuals carrying those separate 'favourable' little mutations are all at variance with one another. They are each trying to 'displace' the other because of some supposed minute 'survival advantage' they have over their 'less favoured companions.' Who can rate the chance of successfully combining any two of those needed mutations when the mutants concerned are feuding for survival instead of cooperating with each other? And, how many generations will be required in the process?

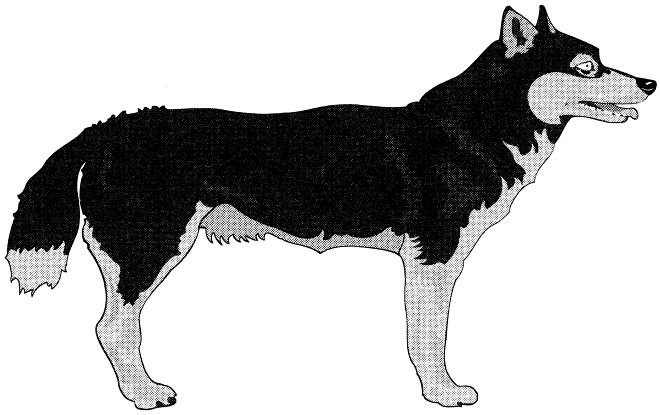
Cases in which success in selection is assured

There can be situations in which *artificial* selection can be 100% efficient, and in which it can be 100% certain that the right male/female pair can be mated to produce a pure-breeding stock. Three such situations exist when the favourable mutant character is either of the 'recessive' type, or of the 'codominant' type, or of the 'incompletely dominant' type. In the two examples given above, the favourable factors, for eyes and wings, were both of the completely 'dominant' type which give rise to the uncertainty and chance element in selection. Thus, if Huxley is right in his assertion that 'by artificial selection, man has been able to combine many times ten favourable mutations 'to produce the kinds of breeding stock he wants, then it is almost certain that those favourable mutations were not of the 'dominant' type. Otherwise man could never be sure that he had produced a pure-breeding stock for all of those desirable characters;—the occasional 'black sheep' would always keep cropping up in the midst of the supposedly pure-breeding all-white population if the factor for white was 'dominant,' and the factor for black was 'recessive.'



It is easy to conceive situations in which a form of *natural* selection can also be 100% efficient in establishing a pure-breeding variety for a newly 'mutant' character. This is because the simplest and purest form of *natural* selection is the Divinely ordained form, in which organisms reproduce after their own kind out of *preference* for their own form; and in this matter the organisms *themselves* know no uncertainty in selecting their breeding partners, leaving nothing to chance. If 'gentlemen prefer blondes,' then a race of blondes would be instantly established just as soon as the 'favourable' mutation of being blonde appears in the first individual. In this way, it is easy to account for the successful establishment of, say, a pigmy race of humans.

Likewise, insects and birds which pollinate plants might develop an instant and exclusive preference for a spontaneously appearing new plant variant, thus selectively establishing a population of the new plant variety.



There is not the slightest need to invoke the hideous dogma of 'selection by survival,' 'struggling for survival,' and 'survival of the fittest' as the explanation for the establishment of populations of new varieties. The percentage of populations of new varieties established by means of 'selection by survival' must be infinitesimal, if not in fact zero.

Fundamental difference between natural variation and evolution by means of natural selection

1. Natural variation and beneficial (or harmless) 'mutations'

The 'mutations' which man is selecting for breeding into his livestock are not the sudden *creation* of entirely new features like tails, scales, thorns, fruit, *etc.* Instead, the new features were hidden and not expressed for untold generations. (The 'recessive' characters already spoken of come under this category). The genes required for the expressing of the character had been present right from the beginning of the creation. It is easy to see the Creator's purpose in creating genes to behave like this. The created species, or 'kind,' carried all the genes from the very beginning, but the full expression, or suppression, of certain of the genes in one variety of the species makes it perfectly adapted to its environment. The same thing is true for a different set of genes in another variety of the same species or 'kind' in a different environment. And so it is also for the case of the expression of a blend of those characters. There is enormous built-in scope for variation within a true species or 'kind,' which has been placed there by the Creator from the beginning. It is that scope which man is able to tap in his breeding efforts when he sees these changes suddenly appear, and chooses to 'select' them artificially for his stock.

2. Evolution, harmful mutations and their 'selection'

Natural variation cannot be seized upon to furnish 'proof' that species, or 'kinds,' have evolved from one another. Monkeys and chimpanzees are alleged to be our closest 'relatives,' and the 'kind' of creature we are supposed to have evolved from. But genetically there is an unbridgeable gap separating the three kinds. This is seen from the chromosome numbers found in each kind:

Rhesus Monkey	— 42 chromosomes,
Man	— 46 chromosomes,
Chimpanzee	— 48 chromosomes.

As the chromosomes occur in pairs, man would have needed to evolve two extra chromosomes in order to evolve from the monkey; and on the same basis of reasoning, the chimpanzee would need to have evolved one extra chromosome in order to evolve from man!

In order for evolution to take place, entirely *new* genes need to be *created* which did not exist previously. And each new chromosome that is evolved will carry thousands of new genes along its length. And the evolutionist's supposedly newly evolving complex organs, such as eyes, need literally '*many* times ten' entirely newly created genes to synthesise the proteins and enzymes, *etc.,* used in the making of the new organ. And each one of these new genes will itself be the product of hundreds, or even thousands, of what are known as 'point' mutations. Now, as we shall see later, while these new genes are allegedly evolving with each successive point-mutation, the changes are literally *imperceptible* and *minute,* so much so that there can be *no* new characteristic or 'survival value' to select until the changing, so-called 'junk' DNA has been transformed sufficiently to turn it into a *functioning* gene. Then, the now functioning new gene has got to be either selected or eliminated. But the theory of evolution requires that the effect of the new gene itself must also be minute and virtually unnoticeable. This means that the probability of the new gene being selected as having survival value is virtually zero.

So then, the fundamental difference between the true 'natural' selection taking place in the real world, and the 'selection by survival' taking place in the imagination of the evolutionists, is the difference between certainty and uncertainty with gradualism and chance.

The probability of the evolved gene being selected

Since the successful working of (the evolutionist's) natural selection is itself seen to be subject to the working of chance, we would like to try to estimate the chance that natural selection might have of succeeding in doing its job.

We have already seen that natural selection is grossly inefficient in doing its job of fixing a favourable mutation in a population compared with artificial selection. Secondly, we have seen that the evolutionists themselves require the mutation to be minute in its individual effect, thus severely handicapping natural selection still further in its attempt to select something having survival value. Thirdly, Huxley mentioned a value of (maybe) '1 chance in a million.' In view of all this, we will be very bold and suggest a value of 1 chance in 2 (a very high estimate, by the way).

Huxley was also confident that if man could successfully combine many tens of favourable mutations in the founders of a new population, then so also could natural selection. In that case, let us arbitrarily suggest that natural selection is required to combine and fix 91 favourable mutations in the founding male/female pair of a new population. What is the probability of it succeeding? It is:

> $\frac{1}{2}$ multiplied by itself 91 times, or $\frac{1}{2}^{91}$
> *i.e.* 1 chance in
> 2,475,880,078,570,760,549,798,248,448.

That is an exceedingly small chance. To get some idea of just how small a chance this is, let us realise that this is also the chance that a gambler would have of tossing 91 coins into the air and finding that they all landed 'heads up.'

Those, then would be the odds against natural selection succeeding in combining all 91 mutations in a male/female pair founding a new population. In which case it is seen that there is something seriously wrong with the claims made about the supposed power of natural selection. The supposed secret of natural selection's success is its power to defeat overwhelming odds. Instead we find that natural selection is itself defeated by overwhelming odds! An evolutionist has said that it was improbable in the highest degree that the human eye should have arisen as the result of random mutations alone. What was needed to defeat the improbability of it all was a mechanism to select and combine all the separate and scattered 'useful' mutations and minuscule bits of development that *might* accumulate to form the marvellous organ. And how was that selection to be carried out? It was to be done by seeking:

> '... to modify all things by blindly starving and murdering everything that is not lucky enough to survive in the universal struggle for hogwash' (Shaw).

Hence,

> 'We find teeth and talons whetted for slaughter, hooks and suckers moulded for torment—everywhere a reign of terror, hunger, sickness, with oozing blood and quivering limbs, with gasping breath and eyes of innocence that dimly close in deaths of cruel torture.' (Romanes).

'Nature had to be rather ruthless about this process,' we are assured! But the selection process, as defined, is not only fiendishly cruel and ruthless, it is also just as blind and random as the blind and random process for which it is supposed to be the miracle cure! 'Can the blind lead the blind?' The only thing that can cure the selection process's fatal disorder is the elimination of the chance element from its workings and the removal of the last vestige of uncertainty from the process.

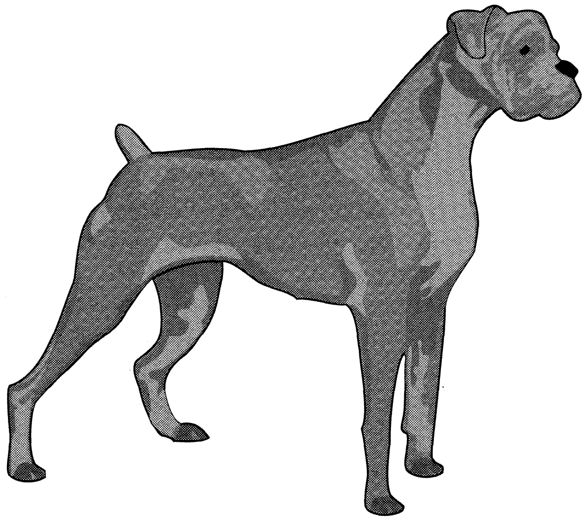
It might be objected that there must be something seriously wrong with the analysis just carried out if it is true that man has succeeded in combining about the same number of mutations in his domestic breeds of livestock.

'Natural Selection'—the breeder's definition of a nightmare!

But is Huxley's claim valid that man has *combined* tens of favourable mutations in a single organism to form a new variety? It is perfectly true that man has produced, say, about 400 to 500 *varieties* of dogs from an original handful of 'wild' varieties, but it is surely not true to say that he has *combined* 400 to 500 new characters in a *single* dog to produce that particular new variety of dog.

Next, whenever man has succeeded in combining in a single individual several, originally separated, newly mutated characters, those new characters were almost certainly not of the completely 'dominant' form. In artificial selection the chance element can be entirely absent in suitable cases, and success is assured when, for example, only recessive 'favourable' characters need be selected to be combined in a new pure-breeding variety, and when those characters are unmistakable and clear cut. But if the new characters to be combined are of the 'dominant' type, and/or not easily identifiable, then uncertainty and the chance element will always be involved in selection, no matter how efficiently the breeder selects his individuals for breeding the next generation. He can never be sure that he has produced a new pure-breeding variety combining all the new characters. So then, man is able, in suitable circumstances, to combine several newly appearing characters without chance affecting the selection process and the success of the venture. Not so, however, with natural selection as it is defined by the evolutionist.

Dawkins, in trying to justify himself, is advocating the adoption of 'natural selection techniques in attempting to find the best design for things like aircraft propellers and turbine blades. He would have us to suppose that such random generation of design, with successive selection of marginally 'favourable' improvements, is a more efficient and powerful design technique than the conventional analytical approach to design. But he would not dare to tell a breeder of livestock, who depends upon his breeding results for his livelihood, to abandon the use of artificial selection in favour of natural selection.



Just imagine a poultry breeder who wants to combine in a single variety of domestic chicken the following eight 'favourable' characteristics:

(1) Prolific egg laying,
(2) Tender white meat,
(3) Low body fat,
(4) Low food consumption,
(5) Hardiness in a harsh environment,
(6) Long living,
(7) Fast running,
(8) Powerful flight.

The characteristics are not necessarily new, but to start with, no two of them are combined in a single variety of chicken. (If some characteristics are 'sex-linked,' it might be impossible to combine them). And now suppose that the breeder takes Dawkins' advice in allowing 'natural selection' to do the job of combining the eight characteristics. What chance of success will natural selection give him? Why of course, we know that his chance of succeeding is very poor indeed even with the most efficient use of artificial selection. But we do not need to be mathematicians to see that his chance of succeeding is virtually nil if he leaves the work to natural selection. Such a scenario is a breeder's nightmare!

Human-kind is pure-breeding for myriad 'favourable' characteristics

So far we have calculated the chance of natural selection being able to combine only a few tens of mutations in a pure-breeding population. But our evolutionist friends have told us that we humans are the product of the combination of literally thousands of millions of mutations. In that case, before proceeding further with our calculations, we need to know more about the nature of mutations themselves.

Mutations and DNA

The most minute mutations that occur (and the type which are supposed to provide the 'raw materials' for evolution to go to work on) are random changes to the genetic information carried by the sequence of four types of chemical units called 'bases' or 'nucleotides,' which make up the long chain-molecule known as DNA. A specimen segment of the DNA sequence of the G4 virus is shown here to give an idea of what is involved:

ATG AAG TCT CGA CAT GGC TTT . . . . . .

Each 'A' in the sequence is the base 'adenine,' each 'C' the base 'cytosine,' each 'G' the base 'guanine,' and each 'T' the base 'thymine.' The sequence of bases is not random and conveys precise genetic information, which is 'read' by a living cell, in just the same way as the sequence of letters on this written page is not random and conveys precise information which can be read. The DNA sequence of an organism is specific to that organism alone, and specifies the precise chemical and physical construction and behaviour of the organism; although quite unrelated species often have some gene sequences in common on their DNA. The segment shown here is the start of the 'A' gene, which codes for the synthesis of the 'A' protein of the virus. The virus has a total of 5,577 bases along its DNA. By comparison, the DNA sequence that codes for human heredity has an estimated six thousand million bases. If the sequence were written in book form, it would be long enough to fill a whole library of a thousand books, each book containing the equivalent of 1 million words!

The point is this, changes to the DNA sequence of an organism change the heredity of the organism. Such changes are called mutations. And it is the theory of evolutionists that one kind of organism can be changed into another kind simply as a result of changes to the DNA. More than that, they claim that that is precisely what has happened in evolution. Species have been changed from one kind into another, simply as a result of random changes to the DNA and the action of natural selection in preserving and accumulating the best of the mutations for the formation of new characteristics. The progress of evolution has always been in the direction of increased DNA raw material to provide increased organic complexity and diversity and sophistication. In this way, all life forms evolved from a 'common ancestor' which was a virus-like organism having only about five thousand bases of DNA.

The random changes to the DNA are of three kinds. Bases can be added to the sequence, or deleted from the sequence, or they can be changed for a different base (substitution of bases).

But if humans have evolved in this way from being originally a virus-like organism which had only about 5,000 bases in its DNA, into an organism having about 6,000,000,000 bases in its DNA, then we are quite literally the product of at least 5,999,995,000 mutations of the addition type! And the new bases would almost certainly have had to be added on to the growing DNA at the rate of no more than one per generation, as we can deduce from the next quotation.

Professor Royston Cloves, in his excellently readable and informative little book, *The Structure of Life* (1967), explains how these ‘micro,’ or ‘point’ mutations occur as ‘copying errors,’ when a copy of the DNA is being made in the germ cell in readiness for passing on to the next generation when the organism reproduces after its own kind. The only thing that spoils this otherwise factual book is his evolutionary interpretation of the scientific facts. He says,

> ‘Spontaneous mutations, as we have seen, are usually exceedingly rare events. They may be regarded as copying errors during the replication of the DNA. The pairing of any base with its “correct” partner, *e.g.* adenine to thymine, is a highly efficient process, but Nature has purposely designed it so as to be not quite perfect, for mutations provide the raw materials which are shaped by the forces of evolution. The incorporation of the “wrong” base by “incorrect pairing” at any one site seems to occur about once in 10^{11} replications. Since there are about 1,000 nucleotide pairs per gene, a mistake in any one gene therefore occurs about 1 in 10^8 replications to produce a “mutant”.’

The probability that natural selection combined and fixed 5,999,995,000 mutations

So then, we have been told that we humans are the product of at least 5,999,995,000 successive point mutations, and that natural selection must have successfully combined and fixed those mutations in a single pure-breeding organism called *Homo sapiens.* (There would have had to be vastly more than that number of mutations in order to eventually arrive at the correct *sequence* of bases; but for the moment our only interest is in the *addition* of new bases, since the addition of so many new bases is a vital element in the evolutionary development. Every addition of a new base must therefore be regarded as a ‘favourable’ mutation, almost regardless of whether or not it is the correct type of base in the correct position in the sequence).

The probability that natural selection would succeed in combining and fixing that number of favourable mutations would be ½ multiplied by itself 5,999,995,000 times, which is

$2^{-5,999,995,000}$

or 1 chance in $10^{1,806,178,469}$

We will for brevity's sake call this probability P1.

But just how big is that number $10^{1,806,178,469}$? It is a ‘1’ followed by 1,806,178,469 zeros; which means that if it were typed out in full at the rate of 12 zeros to the inch, it would stretch for more than 2375 miles; or fill a small library of more than 300 books, each containing the equivalent of 1 million ‘words.’

P1 is also roughly the probability that the human race will become extinct due to the fact that every child born to the present population will be male, with no more females being born.

The probability that the DNA would grow in length by the addition of 5,999,995,000 bases

The probability we are now about to consider is quite independent of the previous probability, and natural selection does not have anything to do with it, either to improve or worsen the probability. To say that natural selection has any influence on it would be as absurd as to say that the result of tossing a coin has an influence on the result of throwing a die. Whether the result of a point mutation will be either an addition, or a deletion, or a substitution will not be the least bit influenced by whether it will next be selected or not. Therefore natural selection cannot ‘make possible’ or ‘speed up’ the accumulation of 5,999,995,000 new bases on the DNA. It can be no ‘miracle cure’ for the extreme improbability of that many successive point mutations all being of the addition type.

We have seen that point mutations do occur at a particular site on the DNA about once in 100,000,000,000 replications. When a copying error does occur at that site, it is equally likely that it will result in either a base being deleted, or changed to a different base, or an extra base being added. Therefore, the probability of a new base being added to the DNA as a result of a point mutation is 1/3.

As a point mutation occurs so rarely (certainly only once in several hundred, or even thousand cell generations) it is obvious that there is not enough time in which to cram 5,999,995,000 successive point mutations of the addition type in the meagre ‘4,000 million years of history’ behind

human evolutionary development. (One human generation alone spans 20 to 25 years, and the most efficient selection process requires at least two generations in which to fix a single mutation; while the inefficient natural selection process requires an unspecified, but very large, number of generations in which to do the job. Moreover, the common frog, which has about 9,000,000,000 bases in its DNA, requires 3,000,000,000 successive point mutations of the addition type more than humans in its evolutionary development. That means that it requires up to 50, 000, 000, 000 years extra in order to accumulate those additional bases).

Since it was necessary for the 'common ancestral' micro-organism to accumulate 5,999,995,000 additional bases on its DNA in order for human-kind to evolve, let us assume there were indeed at least 5,999,995,000 generations in our genealogy in which the 5,999,995,000 point mutations did occur. (As we have seen, there will hardly have been time for any more successive point mutations to occur in our genealogy). And now let us also assume that every one of those point mutations was a 'favourable' one in the sense of being of the 'addition' kind, thereby lengthening the DNA and providing 'raw material' for evolution to fashion. (There was certainly no time available for 'unfavourable' mutations).

What, then, is the probability that every successive point mutation would be of the 'addition' type? The probability is

$3^{-5{,}999{,}995{,}000}$
or 1 chance in $10^{2{,}862{,}725{,}143}$
We will call this probability P2.

It can be seen that this probability is worse than P1 by a factor of $10^{1{,}056{,}546{,}674}$, but it is left to the reader to try to comprehend its magnitude. And yet this probability does not even begin to represent the true statistical barrier opposing the evolution of human-kind. Simply lengthening the original DNA strand by 5,999,995,000 bases is the *minimum* that is required of evolution; and, at best, evolution was granted the barest minimum amount of time in which to achieve this lengthening—if the evolutionary geologists, *etc.* are to be believed regarding the length of geological time! But this calculation did not take into account the fact that living things *cannot* be mutilated by so much mutation without being killed stone-dead. The transition from one species to another would have to be a smooth, *harmless* one; and if there *was* a smooth pathway through the changing DNA sequence, it would be bound to require vastly more than a mere 5,999,995,000 point mutations. But then, here is where we will be brought back to the argument that natural selection is needed to steer the course of evolution along a 'tolerable' pathway for the sensitive organism. So then, let us now combine the results we have found so far.

The combined probability that human-kind evolved

The two elements that evolutionists claim were involved in human evolution were (1) variation through random mutation, and (2) sorting and combining those variations through selection by survival.

But we have seen that both elements are subject to chance and uncertainty, and that neither chance element is influenced by the other. The two probabilities are independent of each other. (It is rubbish to speak of variations occurring due to 'selection pressure'!) Therefore the combined probability if the product of the separate probabilities, *i.e.* (the probability that the mutation will occur) multiplied by (the probability that the mutation will be 'selected'). In the present example, the combined probability that human-kind evolved is found to be

(Probability P1) multiplied by (Probability P2)
$= 10^{-1{,}806{,}178{,}469} \times 10^{-2{,}862{,}725{,}143}$
which is 1 chance in $10^{4{,}686{,}903{,}612}$
which we will call P3.

Now this is no chance at all! P3 is the number '1 million' multiplied by itself 778,150,602 times. Written in words, thus: 'one million million million ... million,' it would fill more than 778 large volumes, each having 1000 pages, with the word 'million' printed 1000 times on each page. If it were typed out as a number, thus, '1,000,000,000,000... ... 0,' typing 12 zeros to the inch, it would stretch out for more than 6,140 miles—the sort of distance between London and Cape Town. It also represents the chance that, if 5,999,995,000 dice were thrown, every one of them would result in a 'six'! So then, this result is mathematics' own way of trying to say as emphatically as it can, '**IMPOSSIBLE!**'

But then, what has happened to the claim of the evolutionist that it is natural selection that makes it all possible?—the claim that '... with the aid of the machinery for producing improbabilities provided to life by Natural Selection, the improbability can be and has been actualized'? Surely it is an incredible thing that brilliant men like Huxley and Dawkins should have been unable to see the glaring fallacy in their theory! The fatal flaw in the argument is that natural selection itself (as they themselves define selection as being 'natural') is blind and subject to the vagaries of chance. If the evolutionist had been content to claim that life evolved purely by chance through the mechanism of random mutations alone, his case would not have sounded too bad (if probability P2 can be regarded as that good). But, by inventing the myth of miracle-working natural selection as the cure for the overwhelming odds against the chance formation of life, he has *worsened* his case by a factor of $10^{1,806,178,469}$. You might just as well argue that, since the odds against a million monkeys being able to type, say, a perfect version of the book, 'The Selfish Gene' are too great, the job could be done quicker by employing another monkey to 'select' the most 'promising' scripts produced by the other monkeys. This selection process would be just as blind and 'chancy' as the process it is supposed to be helping.

The statistics most decidedly are *not* strongly in favour of the evolution of life!

Conclusion

No matter how we try to estimate the probability that life evolved, we cannot escape from finding probabilities so infinitesimal that they can only be equated with zero. It is therefore clear that the evolutionists, in making their wild claims in the name of 'science,' never bother to do their homework properly. So why do they cling so desperately to the myth of the origin of life and species by means of natural selection? The answer was given early in this century by Sir Arthur Keith (and, by implication, re-iterated by Dawkins throughout his Christmas lectures) when he said:

> 'Evolution is unproved and unprovable. We believe it because the only alternative is special creation, which is unthinkable.'

The creation itself is the all-sufficient proof that it owes its origin to the work of an Almighty Creator, in just the same way as the books, *The Selfish Gene* and *The Blind Watchmaker*, are proof of the existence of the author whose name they bear. We know those books owe their existence to the creative work of their author, and that he did exist, and hopefully still exists, in spite of all the clever arguments of some to the contrary.

But the most sure proof that the Creator exists was given by the Creator Himself, when, in love for us, He sent His only Son into the world bringing us the message,

> 'Draw near to God and He will draw near to you.' (James 4:8).

So why try to run away from Him? It is salvation to run into His welcoming and merciful arms.

References

ANON (1956) *Genetic Effects of Atomic Radiation.* Science 123:1159
CLOVES, R. (1967) *The Structure of Life.* Penguin Books, New York. p.213
HOWELLS, W. (1967) *Mankind in the Making.* Pelican Books, New York. p.27
HUXLEY, J (1946) *Chance and Anti-Chance in Evolution* The Fortnightly, London. April:236
KENNY, M. J. (1966) *Teach Yourself Evolution.* English Universities Press, London. p.81
MAYR, E. (1978) *Evolution.* Scientific American, 239(3):42–43.
SHAW, G. B. (1947) *Back to Methuselah.* Oxford University Press, Oxford.
UNKNOWN (1966) *Planets*, Life Science Library, Time-Life International (Nederland) NV, Amsterdam. p.177

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Did Bats Evolve Twice?

Paul Garner

BATS HAVE RECEIVED a great deal of 'bad press' over the years as a result of folkloric traditions which associate these animals with vampirism and the supernatural, or with the spread of disease. It is only since 1981 that British bats have enjoyed legal protection. Yet in some ways, bats are extremely successful creatures. In terms of number of species, the bats—or chiropterans—are beaten only by the rodents.

There are 950 different species of bat, which are classified into two main subgroups—the Megachiroptera, and the Microchiroptera. The megabats number around 175 species, including the fruit bats of the Old World. They are usually quite large, some having wingspans of over 5 feet, and they tend to have big, forward-facing eyes. The 775 microbat species are generally smaller, as their name suggests, and they have proportionately small eyes (Wardhaugh 1987).

The Earliest Bats

Classical evolutionary thought is that bats evolved from a primitive non-flying mammal, passing through an arboreal gliding phase somewhat similar to the flying squirrels today (Wardhaugh 1987 p.3). Modern shrews, moles, and hedgehogs are thought to have shared the same non-flying ancestor with the bats. This evolutionary scenario is, however, totally without empirical foundation. The beautifully preserved skeleton of the world's 'earliest' known bat *(Icaronycteris index)* was discovered several years ago in Wyoming, USA. At an estimated 50 million years old, this 'anatomically precocious' bat is essentially identical to microbats alive today (Jepsen 1966). It even possessed the same sophisticated sonar system as modern microbats (Novacek 1985). The 'oldest' species of megabat *(Archæopteropus transiens)* post-dates the microbats at an age of about 30 million years on the evolutionary time scale, and is also very similar to modern species.

Clearly the bats appear in the fossil record without intermediates connecting them to their putative ancestors. The lack of evidence for the hypothesised transition is usually regarded as the result of an incomplete fossil record. Wardhaugh says: 'In common with other terrestrial organisms not normally inhabiting coastal or estuarine environments, fossilised bats are few and no intermediate stages in their evolution have yet been found' (1987 p.2). However, those specimens which have been recovered are extremely well preserved. *Palæochiropteryx tupaiodon* from the Middle Eocene of Germany even has undigested moths preserved in its stomach (Grantham-Hill 1989), as did the specimen of *Icaronycteris index* described by Jepsen (1966 p.1333). It seems remarkable, in terms of the length of time and numbers of individuals that must have been involved in the transformation of a non-flying creature into a bat, that not a single intermediate has been discovered. As far as we can tell from fossils, bats have not undergone any major morphological change since they first appeared on the earth.

Debate over Bat origins

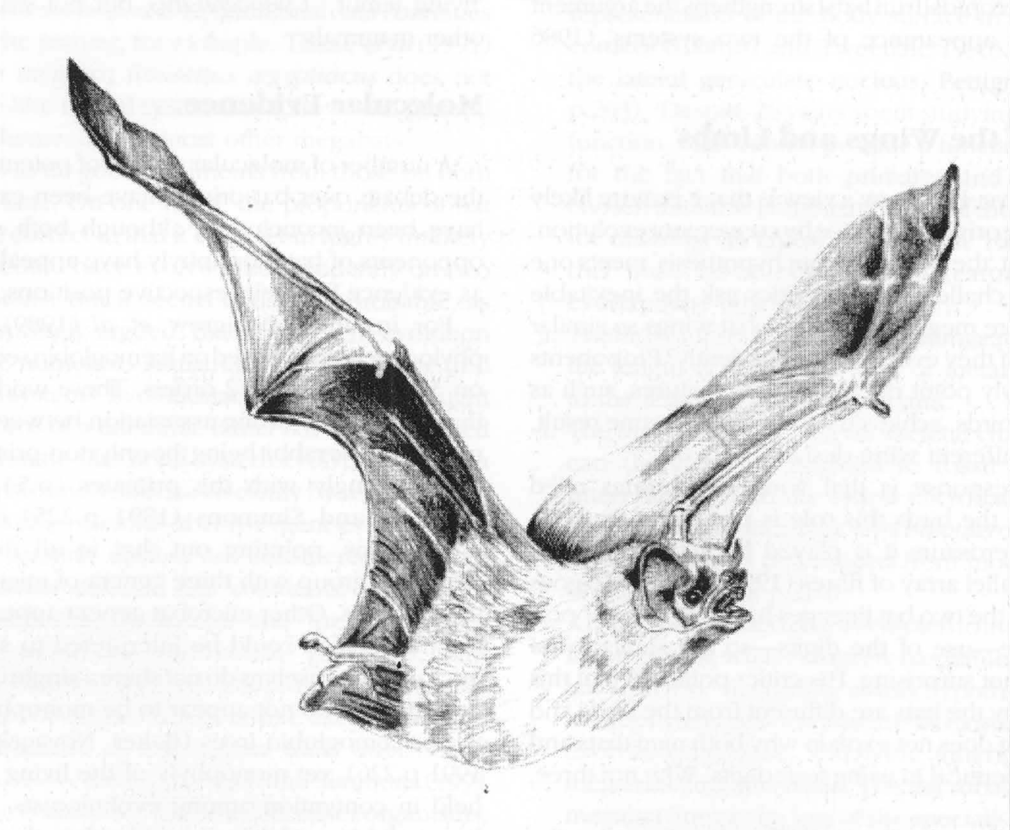
Ever since Linnæus (1758) classified the bats with the primates based on his dissection of a megabat, there has been debate on the taxonomy of this group. Some later workers endorsed Linnæus's placement (*e.g.* Leche 1886), while others disputed it (*e.g.* Winge 1892). Nevertheless, the orthodox evolutionary position has been that the bats form a monophyletic group. That is to say the megabats and the microbats are descended from a common mammalian ancestor which had evolved the ability to fly, and from which they both inherited the distinctive bat wing.

In more recent years, fiery debate has been kindled by the suggestion that the two types of bat may have evolved independently, rather than from a single common ancestor. I will summarise here the main arguments which have been raised in the technical literature, to provide readers with an overview of the current controversy.

Evidence from Neural Organisation

The debate arose following the publication of a report by John Pettigrew of the Vision, Touch and Hearing Research Centre at the University of Queensland, Australia. His paper (1986) showed how the pattern of connections between the retina of the eye and the midbrain in species of a fruit bat *(Pteropus)* were of an 'advanced' kind previously found only in primates (the group including the apes, monkeys, and man) and dermopterans ('flying lemurs'). In contrast, the microbat *Macroderma gigas* was found to have a 'primitive' pattern of brain organisation in common with all vertebrates except for the primates and dermopterans.[1]

Pettigrew considered it highly unlikely that the neural characteristics shared by the primates and megabats had evolved independently in these two groups. Therefore, he argued, the megachiropteran fruit bats must have shared a common ancestor with the primates and dermopterans, and not with the microbats. His ideas have been labelled 'the flying primate hypothesis,' and proved to be highly controversial for one major reason—if the megabats and



Leisler's Bat *(Nyctalus leisleri)*, a micro-bat which is rare in England and Ireland and absent from Scotland and Wales

the microbats did not share a common ancestry, then the distinctive bat wing must have evolved twice!

Critics of the 'flying primate hypothesis' (*e.g.* Martin 1986) have argued that the similarities in brain organisation between primates and megabats are the result of convergent evolution, and are not derived features (*i.e.* inherited from a common ancestor). Convergence is thought to be where two or more groups of organisms have evolved to resemble one another, but where common ancestry is lacking; similarities are therefore analogous rather than homologous (Dowdeswell 1984 p.167).

However, Pettigrew (1991a p.201) counters that convergence is usually obvious in the brain because there are many different neural set-ups which produce the same end result. He gives the example of cats and owls which have functionally indistinguishable stereoscopic vision, but with completely different underlying visual pathways (Pettigrew and Konishi 1976). Further, he states (p.201) that the retinotectal pathway from eye to midbrain 'is curiously reduced and specialised in primates, where it plays a role that is so obscure that there has been much debate about whether it is functional at all.' He questions whether it is reasonable to envisage functional convergence occurring in such a pathway (p.202). Pettigrew implies that it is easier to envisage convergence of wing structure since this is more obviously of functional significance, and open to natural selective pressures.

Proponents of bat monophyly point out that it is unlikely that the neural arrangements cited by Pettigrew are really functionless. Baker, Novacek and Simmons (1991 p.219) say, 'a more reasonable assessment is that we simply do not yet understand the functions of these features,' a view with which creationists will concur. They suggest some possible functions—improvements in binocular vision, eye–hand coordination, depth perception, detailed object vision, and motion detection—ironically citing two studies published in a book co-edited by Pettigrew (Kaas 1986; Sanderson 1986)! Their response to Pettigrew's statements regarding wing structure will be dealt with in the next section.

Additional research has revealed other neural features shared by primates and megabats, but not microbats. Pettigrew says that the critics' arguments for convergence 'have weakened further with each subsequent discovery of other derived brain features uniquely shared between primates and megabats. These discoveries show no sign of abating, with predictions on the basis of primate brain structures so far being verified in four additional, independent neural systems of megabats' (1991a p.202).[2] Pettigrew concludes that, 'The similarity of so many different and complex details of visual organisation in primates and pteropids [fruit bats] strengthens the argument against parallel appearance of the two systems' (1986 p.1306).

Structure of the Wings and Limbs

As noted above, Pettigrew's view is that it is more likely that the bat wing originated twice by convergent evolution. But it is here that 'the flying primate hypothesis' meets one of its strongest challenges. His critics ask the inevitable question: why are megabat and microbat wings so similar in construction if they evolved independently? Proponents of bat monophyly point out that other creatures, such as pterosaurs and birds, achieved essentially the same result, but with very different wing designs.

Pettigrew's response is that wing membranes need support, and in the birds this role is played by feathers, while in the pterosaurs it is played by actinofibrillæ, a regular and parallel array of fibres (1991a p.208). He goes on to argue that the two bat lineages had only one support option available—use of the digits—so the similarity of wing design is not surprising. His critics point out that this may explain why the bats are different from the birds and pterosaurs, but it does not explain why both megabats and microbats are identical in using four digits. Why not three, for instance?

Pettigrew draws attention to differences between the wings of microbats and megabats, which he claims support the hypothesis of separate origin—for instance, differences in the shoulder joint and flight muscles (Strickler 1978). He argues that the M/P Index, a skeletal measure of the forelimb and hindlimb digits,[3] divides megabats and microbats into two separate, non-overlapping groups (Pettigrew 1991a p.209). Microbats have high M/P Index values, while megabats and primates have low values.[4] Baker, Novacek and Simmons (1991 p.220) reply that it is unclear why this particular index should be more important than any other measurement or skeletal feature in illuminating possible relationships. They list 18 unique features of the postcranial musculoskeletal system which unite megabats and microbats (p.218).

Other Anatomical Evidence

Wible and Novacek (1988) highlight various features of the skull, cranial vascular system, fœtal membranes, and nervous system, which are shared by megabats and microbats, and are absent in primates, 'flying lemurs,' and tree shrews. Recent work by Thewissen and Babcock (1991) has also shown that a distinctive pattern of facial and cervical spinal nerves unites both megabats and microbats. These data are cited in support of a single origin for the Chiroptera. In contrast, the published results of a survey of the mammalian genital system has lent support to 'the flying primate hypothesis' (Smith and Madkour 1980). They found that primates have an arrangement of the glans penis that is shared with the megabats and the 'flying lemur,' *Cynocephalus*, but not with microbats or other mammals.

Molecular Evidence

A number of molecular studies of potential relevance to the debate over bat origins have been carried out. Most have been inconclusive, although both supporters and opponents of bat monophyly have appealed to such data as evidence for their respective positions.

For instance, Pettigrew *et al* (1989) present three phylogenetic trees based on hæmoglobin sequence analyses on 34 species from 12 orders. These workers concluded that there was a strong association between primates and megabats, the rabbit being the only non-primate associating more strongly with the primates (p.541). But Baker, Novacek and Simmons (1991 p.225) reach different conclusions, pointing out that in all three cases, the megabats group with three genera of microbats, not with the primates. Other microbat genera appear elsewhere in the tree, which could be interpreted to suggest that the microbats themselves do not share a single origin! Similarly, the primates do not appear to be monophyletic in any of these hæmoglobin trees (Baker, Novacek and Simmons 1991 p.226), yet monophyly of the living primates is not held in contention among evolutionists. The data from hæmoglobin analyses are evidently rather ambiguous.

Even studies specifically designed to illuminate the question of bat origins have been equivocal. Restriction map analysis of the ribosomal DNA gene complex failed to resolve the debate one way or the other (Baker, Honeycutt and van den Bussche 1991). This particular study encountered difficulties which the authors believe will hamper all future molecular studies on chiropteran origins. They suggest that it will be extremely difficult to determine relationships among lineages produced in rapid evolutionary bursts (adaptive radiations), as is thought to be the case with the bats.

Other recent molecular evidence has been adduced in favour of bat monophyly—including study of DNA sequences in 12S ribosomal RNA (Mindell *et al.* 1991; Ammerman and Hillis 1990). Ammerman and Hillis conclude that, 'The bats appear to be monophyletic, however this conclusion is not well supported by the mitochondrial sequence data.' Studies involving cytochrome oxidase subunit I (Mindell *et al.* 1991), cytochrome oxidase subunit II (Adkins and Honeycutt 1991), and the epsilon globin gene (Bailey, Slightom and Goodman 1992) are also cited in support of a monophyletic origin (Novacek 1992).

Common Ancestry, Convergence, or Creation?

Resolution of this complex debate is still awaited, if indeed it will ever be resolved. Pettigrew (1991b p.238) laments that unless physicists can invent a means of space–time travel then direct verification of evolutionary hypotheses will never be possible! Additional data continues to complicate the picture; for example, Thiele *et al* (1991) report that the megabat *Rousettus ægyptiacus* does not have a primate-like neural system but follows the general mammalian scheme, unlike most other megabats.

There seems to be good arguments from those on both sides of the debate. On one hand, the proponents of bat monophyly are correct in that it does seem highly unlikely that bat wings could have evolved independently on two separate occasions. But it seems equally improbable, as Pettigrew has strongly argued, that convergent evolution can explain the numerous similarities in the primate and megabat neural systems. Evolutionary zoologists are caught between the horns of a dilemma. Either bat wings evolved twice, or the primate-like brain system evolved twice.[5] In this debate, transformism can survive only by relying on *ad hoc* and implausible notions of convergent evolution.

But there is another option, not considered by either side in the current debate. The creationist model can account for both the similarities and the differences between the megabats, microbats, primates, and dermopterans. Creationists have proposed a mosaic or modular concept of created kinds, where each baramin is a unique combination of non-unique traits (Morris and Parker 1982 pp.85–7). Baker, Novacek and Simmons (1991 p.220) make the comment that 'bats, like other organisms, are mosaics of traits.' There is even a microbat genus *(Cheiromeles)* that has a grasping, primate-like foot (Martin 1986 p.483). The fact that the megabats and microbats have some features in common with primates, and some in common with each other, poses no problem to the creationist.

The creation model predicts the abrupt appearance of the bats in the fossil record and the absence of transitional connections to non-flying mammals. It also avoids the difficulties of visualising how such a transition could have happened, and provides a ready explanation for the design features in bats which equip them for their aerial existence (N. M. 1968). My conclusion, then, is that the creation model explains the biology and the fossil record of bats better than the various evolutionary models which have been proposed to date.

NOTES

1. Allman (1977) gives four quantitatively defined characteristics of the primate retinotectal pathway from eye to midbrain. It is now known that megabats have all of these features, 'with good quantitative correspondence to those found in a prosimian like *Galago* [bushbaby]' (Pettigrew 1991a p.202). On the other hand, microbats, along with other mammalian and nonmammalian vertebrates, lack all of these features.
2. These are the corticospinal motor pathway (Kennedy *et al* 1987), the lamination pattern of the lateral geniculate nucleus, or LGN (Pettigrew *et al* 1989), the hippocampus (Buhl and Dann 1989, 1991), and the three-fold representation of the body surface in primary sensory cortices (Calford and Tweedale 1990). With regards to the lateral geniculate nucleus, Pettigrew says (1991a p.203), 'Despite 26 years spent studying visual pathway function, I still cannot provide a functional explanation for the fact that both primates and megabats have chosen the same combination out of the 720 possibilities for ordering six layers in the LGN.' He concludes that this must be a homologous feature testifying to evolutionary relationship.
3. The M/P Index (or metacarpophalangeal index) measures the length of the metacarpal, or metatarsal, in relation to the length of the first phalanx.
4. The M/P Index is based on skeletal characteristics, and can therefore be applied to fossil organisms too. Interestingly, both the oldest microbat *(Icaronycteris)*, and the oldest megabat *(Archæopteropus)*, fall within the distributions determined from modern bat species (Pettigrew 1991a p.206).
5. A few evolutionists have attempted to avoid this dilemma by proposing what Pettigrew has named 'the blind cave bat scenario.' According to this hypothesis, the bats are monophyletic, and the primate-like visual specialisations evolved only once, and were inherited by both the megabats and microbats. The microbats arose from the megabat lineage by loss of the specialised brain system, and acquisition of the ability to echolocate. This scenario is at odds with the fossil record, however, in which the microbats appear first. The 'oldest' megabat does not appear until an estimated 20 million years later. Proponents of 'the blind cave bat scenario' appeal to the patchiness of the chiropteran fossil record to explain this discrepancy (Baker, Novacek and Simmons 1991 p.229). Pettigrew (1991b p.236) writes, 'Patchy or not, the fossil record gives us a highly advanced microbat at a very early time and a primitive megabat at a much later time. If I were proposing a later origin for microbats than for megabats, I would like the record to be the other way around.' In addition, there are no transitional forms, living or fossil, which bridge the gap between megabats and microbats (Pettigrew 1991b p.237).

References

ADKINS, R. M. and HONEYCUTT, R. L. (1991) *Molecular phylogeny of the superorder Archonta.* Proceedings of the National Academy of Sciences, USA 88: 10317–21.

ALLMAN, J. M. (1977) *Evolution of the visual system in the early primates.* Progress in Physiology and Psychology 7: 1–53.

AMMERMAN, L. K. and HILLIS, D. M. (1990) *Relationships within Archontan mammals based on 12S rRNA gene sequence (Abstract).* American Zoologist 30: 50A.

BAILEY, W. J., SLIGHTOM, J. L. and GOODMAN, M. (1992) *Rejection of the 'flying primate' hypothesis by phylogenetic evidence from the epsilon-globin gene.* Science 256: 86–9.

BAKER, R. J., HONEYCUTT, R. L. and VAN DEN BUSSCHE, R. A. (1991) *Examination of monophyly of bats: restriction map of the ribosomal DNA cistron.* Bulletin of the American Museum of Natural History 206: 42–53.

BAKER, R. L., NOVACEK, M. J. and SIMMONS, N. B. (1991) *On the monophyly of bats.* Systematic Zoology 40: 216–31.

BUHL, E. H. and DANN, J. F. (1989) *Cytoarchitecture and neuronal composition of flying fox hippocampus.* Macroderma 5: 5.

BUHL, E. H. and DANN, J. F. (1991) *Cytoarchitecture, neuronal composition and entorhinal afferents of the flying fox hippocampus.* Hippocampus 1: 32–53.

CALFORD, M. B. and TWEEDALE, R. (1990) *The capacity for reorganisation in adult somatosensory cortex,* pp.221–36 in M. Rowe and L. M. Aitkin (editors), *Information Processing in Mammalian Auditory and Tactile Systems, Neurology and Neurobiology,* Volume 56, Wiley-Liss, New York.

DOWDESWELL, W. H. (1984) *Evolution. A Modern Synthesis.* Heinemann Educational Books Limited, London.

GRANTHAM-HILL, B. W. (1989) *The World of Bats.* Creation Science Movement Pamphlet 247.

JEPSEN, G. (1966) *Early Eocene bat from Wyoming.* Science 154: 1333–9.

KAAS, J. H. (1986) *The structural basis for information processing in the primate visual system,* pp.315–40 in J. D. Pettigrew, K. J. Sanderson and W. R. Levick (editors), *Visual Neuroscience,* Cambridge University Press.

KENNEDY, W. D., PETTIGREW, J. D. and CALFORD, M. B. (1987) *Cells of origin of the corticospinal tract in the little red flying fox, Pteropus scapulatus.* Proc. Aust. Physiol. Pharmacol. 18: 102P.

LECHE, W. (1886) *Ueber der savgethier gattung Galeopithecus.* K. Sven. Vetenskapsakad. Handl. N.S. 21(11): 1–92.

LINNÆUS, C. (1758) *Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis, Tomus I,* Editio Decima, Reformata. Holmiæ, Impensis Direct. Laurentii Salvii, Stockholm.

MARTIN, R. D. (1986) *Are fruit bats primates?* Nature 320: 482–3.

MINDELL, D. P., DICK, C. W. and BAKER, R. J. (1991) *Phylogenetic relationships among megabats, microbats, and primates.* Proceedings of the National Academy of Sciences, USA 88: 10322–6.

MORRIS, H. M. and PARKER, G. E. (1982) *What is Creation Science?* Creation-Life Publishers Inc., San Diego.

N. M. (1968) *The Chiroptera: The Problems Bats Present to the Evolutionist.* Evolution Protest Movement Pamphlet 158.

NOVACEK, M. (1985) *Evidence for echolocation in the oldest known bats.* Nature 315: 140–1.

NOVACEK, M. (1992) *Mammalian phylogeny: shaking the tree.* Nature 356: 121–5.

PETTIGREW, J. D. (1986) *Flying primates? Megabats have the advanced pathway from eye to midbrain.* Science 231: 1304–6.

PETTIGREW, J. D. (1991a) *Wings or brain? Convergent evolution in the origins of bats.* Systematic Zoology 40: 199–216.

PETTIGREW, J. D. (1991b) *A fruitful, wrong hypothesis? Response to Baker, Novacek, and Simmons.* Systematic Zoology 40: 231–9.

PETTIGREW, J. D., JAMIESON, B. G. M., ROBSON, S. K., HALL, L. S., MCANALLY, K. I. and COOPER, H. M. (1989) *Phylogenetic relations between microbats, megabats and primates (Mammalia: Chiroptera and Primates).* Philosophical Transactions of the Royal Society of London Series B, Biological Sciences 325: 489–559.

PETTIGREW, J. D. and KOANDNISHI, M. (1976) *Neurons selective for orientation and binocular disparity in the visual Wulst of the barn owl (Tyto alba).* Science 193: 675–8.

SANDERSON, K. J. (1986) *Evolution of the lateral geniculate nucleus,* pp.183–95 in J. D. Pettigrew, K. J. Sanderson and W. R. Levick (editors), *Visual Neuroscience,* Cambridge University Press.

SMITH, J. D. and MADKOUR, G. (1980) *Penial morphology and the question of chiropteran phylogeny,* pp.347–65 in D. E. Wilson and A. L. Gardner (editors), *Proceedings of the Fifth International Bat Research Conference,* Texas Tech Press, Lubbock.

STRICKLER, T. L. (1978) *Functional osteology and myology of the shoulder in the Chiroptera.* Contributions to Vertebrate Evolution 4: 1–198.

THEWISSEN, J. G. M. and BABCOCK, S. K. (1991) *Distinctive cranial and cervical innervation of wing muscles: new evidence for bat monophyly.* Science 251: 934–6.

THIELE, A., VOGELSANG, M. and HOFFMANN, K. P. (1991) *Pattern of retinotectal projection in the megachiropteran bat Rousettus ægyptiacus.* Journal of Comparative Neurology 314: 671–83.

WARDHAUGH, A. A. (1987) *Bats of the British Isles.* Shire Publications Ltd.

WIBLE, J. R. and NOVACEK, M. J. (1988) *Cranial evidence for the monophyletic origin of bats.* Am. Mus. Novit. 2911: 1–19.

WINGE, H. (1892) *Jorgfundne og nulevende flagermus (Chiroptera) fra Logoa Santa, Minas Geraes, Brasilien.* Museo Lundii, Copenhagen 2: 1–65.

TELEOLOGY

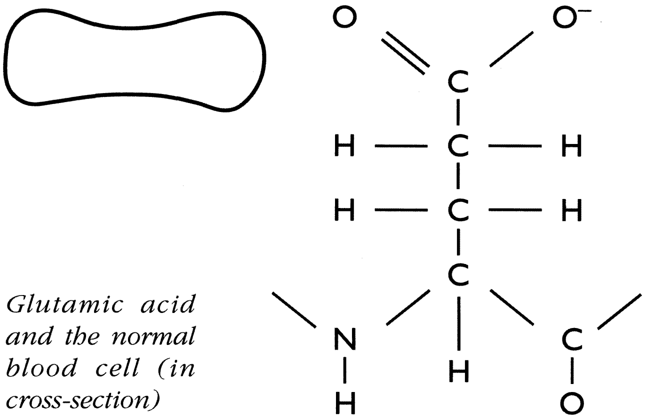
'Teleology is a lady without whom no biologist can live. Yet he is ashamed to show himself with her in public.'

—*Ernst Wilhelm von Brucke (1819-1892), quoted in the* Lancet, *342:8867, 363 (1993).*

News of Creation

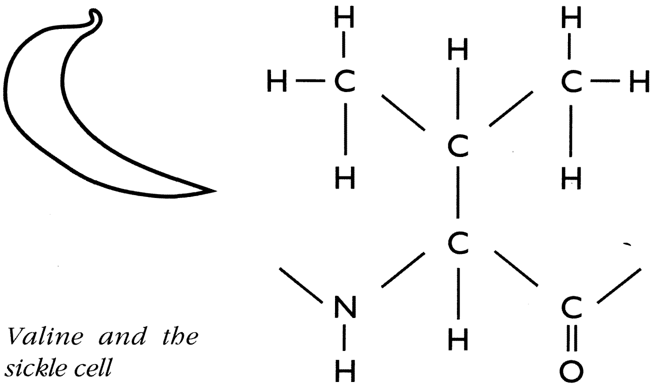
The Sickle Cell Gene

THE NORMAL red blood cell is of a critical shape for maximum absorption of oxygen and a minimum rate of absorption and desorption. It is also mechanically versatile and strong. The shape is affected by the shape of the hæmoglobin molecules that pack it (see John Ling, *Origins* No. 12). The protein chain of hæmoglobin A has the *glutamic acid* unit in its seventh position. If this unit is replaced by *valine*, hæmoglobin S results.



Glutamic acid and the normal blood cell (in cross-section)

The effect on the cell is disastrous. The shape is altered, reducing its efficiency and strength. The life-time of the cells is drastically reduced and leads to premature death. The disease, *sickle cell anaemia*, was first described by J. B. Herrick to the Association of American Physicians on 3 May, 1910.



Valine and the sickle cell

The manifestations of the disease can vary between populations and this has resulted in the publication of a monograph, *The Sickle Cell Disease Patient* (Macmillan Education Ltd., London, 1991) by specialist Felix I. D. Konotey-Ahulu, based on his twenty-five years research at Korle Bu Hospital, Accra, Ghana. One well-known effect is the resistance to malaria which results and this is claimed by evolutionists to be an example of a beneficial mutation, though we fail to see how a fatal effect can be viewed as beneficial! In fact, the effect results because the malarial infection takes three weeks to incubate in the blood cell, which is longer than the life cycle of the defective sickle cells.

Konotey-Ahulu is very strongly opposed to the idea that this offers any support for evolutionary theory, seeing it rather as a demonstration of the effect of the Fall on the perfect Creation.

One concept that he strongly counters is that of 'co-evolution.' Durham, in 1976, proposed that certain tribal customs and behaviours co-evolved through natural selection along with inheritable characters. According to this theory, the festivals of west Africa and their associated beliefs result in the enhanced genetic fitness of the believers. The basis of this belief was because yams contain cyanogenic glycosides which generate cyanate in the body. This, in turn, is effective at reducing the rate of sickling by preventing the crystallization of hæmogloblin S. The rate of consumption of the yams in the festival would have been clinically effective.

The author of the book, who lived in the region described by Durham, shows that this is not a correct deduction and is based on incorrect observation. Yams are expensive and so not eaten that extensively. Further, the 'yam festival' is, in fact, a harvest festival in which the yams feature to only 10%. There is no connection between the festivals, malaria and the gene.

J.H.J.P.

Triassic Termites

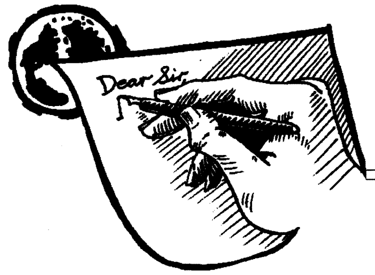
The discovery of fossilised termite nests in the Triassic rocks of Arizona's Petrified Forest National Park has shattered evolutionary theories of how the social insects evolved (*New Scientist*, 5 June 1993).

The evolution of the social insects was thought to have been intimately connected with the origin of flowering plants—the angiosperms—during the Cretaceous. The earliest evidence of social insects in the fossil record was a termite wing fragment in Cretaceous sediments estimated to be more than 100 million years old. Wood with termite damage and termite nests have been documented in rocks dated at 70 million years and younger. Fossils of other social insects, such as bees and wasps, have also been recovered from Upper Cretaceous rocks.

However, theory will have to be revised in the light of recent discoveries by Stephen Hasiotis and Russell Dubiel of the US Geological Survey. These workers have found termite nests, several centimetres across, and connected by a network of tunnels, in Triassic sediments. These rocks are thought to be 220 million years old, which pushes the origin of the social insects back by 100 million years—long before the first flowering plants are thought to have appeared. It is worth noting that Hasiotis has also found crayfish burrows in these same sediments, making them an estimated 190 million years older than the earliest known fossil crayfish.

One other point may be of interest to creationists. The occurrence of *in situ* termite nests in the Triassic would seem to lend support to the idea that the Mesozoic rocks are post-Flood in age, as has been argued in recent issues of this journal. Only after the Flood was over would we expect to find structures like termite nests preserved in the sedimentary record.

P.G.



Correspondence

Graham Wilson

I was very appreciative of Jonathan Stephen's article, *A Biblical Look at Early Civilisation*, and especially with regard to his teaching on the two cultures, separation, *etc.*

Towards the close of his article, however, he referred to the Second Advent drawing attention to 2 Thessalonians 2 which is generally admitted to be a difficult chapter. He interpreted that the Holy Spirit would be withdrawn in the days before the Son of Man comes again.

While this particular viewpoint still finds adherents, many consider it doubtful on the basis of context and exegesis and because the view is not specifically intimated elsewhere in the New Testament.

The Second Advent should, perhaps, be viewed in the light of what transpired in the days of Noah. Before judgment fell, Noah and his family were taken into the security of the ark. When judgment falls again, it will be by fire (2 Peter 3) and not by water. An ark will thus be inappropriate and insufficient. Countless living believers all around the world will need to be changed and taken to safety. The Lord Jesus anticipated this momentous event in Luke 17 and the apostle Paul provided further teaching in 1 Corinthians 15 and in 1 Thessalonians 4 and 5. In this context, the day of grace will end with the Second Advent and not in the time preceding it.

Dr. R. W. Robinson, Surrey

May I say how much I enjoy the articles published in the journal and I'm more than happy to contribute to this worthwhile cause which at least counters so much that is said in the name of science today and, at the most, provides more than enough food for thought. Keep up the good work.

Paul Taylor, Australia

I thought the article by Jonathan Stephen on the *Biblical Look at Early Civilisation* was the best summary I have ever read about this period of time and the early chapters in the book of Genesis.

W. R. Gamble, Isle of Harris

Your literature has been of great benefit to me personally and I believe that the work of BCS is vital for the whole church of Christ.

Robert J. Gilson

A Pregnant Question for Evolutionary Theory

The essence of Darwinian evolutionary theory is that new biological features providing some survival advantage arise from the natural selection of any advantageous mutations that happen to become available during procreative activities. It is generally accepted that the simultaneous formation of all the interacting elements of a new biological structure is highly unlikely and that in practice evolution takes place by the gradual accumulation of small individual steps, for which slow process the vast reaches of geological time provide ample opportunity.

Consider now a very simple biological structure requiring only 12 mutational steps for its evolution. Also let the probabilities be represented by a dodecahedral (12-sided) die with its sides numbered 1 to 12, representing the sequence of mutational steps required to produce the new structure during embryonic development. The probability that the twelve numbers will appear in strict numerical sequence in twelve consecutive throws of the die is 1 in 12^{12}, which evaluates out to 1 in 9,000,000,000,000—an enormous number that rules out any practical possibility of the new structure evolving in a single giant step or macromutation.

The question posed is this: If each of the twelve mutations is sandwiched between large numbers of unusable arbitary mutations, does this improve the probability? I don't see how this is possible. If the twelve usuable mutations have to take place in strict sequence, then the interposing of unusable mutations cannot possibly improve the probabilities. In fact, if many of the interposed mutations were harmful (as is bound to be the case in practice), then far from improving the probability, it must be still further reduced. Indeed, the harmful mutations might well nullify some of the advantageous ones and possibly bring about the demise of the organism before the whole series was completed.

Far from the problems of single-step evolution being overcome by allowing long periods of time for the gradual accumulation of tiny mutational steps, it seems that the longer the time allowed, the greater becomes the improbability! If simultaneous evolution of all the advantageous mutations is highly improbable, then it becomes still more improbable if spread over a long period of time—the more the time, the higher the improbability!

Some alleviation of the problem might conceivably occur occasionally in cases where the embryonic developmental processes of the organism involved could accommodate a slight departure from strict sequentiality, such for instance as, say, 1 2 4 3 5 6 7 9 8 10 11 12, but even if the improbability was thereby reduced a hundredfold it would only reduce the above figure of 9,000,000,000,000 to 90,000,000,000—an insignificant reduction for practical purposes. Any slight improvement in the 'odds against' would certainly be overwhelmed by the adverse effect of the intervening harmful mutations.

Darwin wrote, 'Can it be thought improbable that variations useful in some way to each being in the great and complex battle of life, should sometimes occur in the course of thousands of generations? If such do occur, can we doubt that individuals having any advantage, however slight, over others would have the best chance of surviving and procreating their kind?' Lyell's *Principles of Geology* had convinced Darwin that the geological history of the earth had provided ample time for this gradual process to take place and he took for granted the truth of what seemed to be self-evident. I don't think he can be blamed for this. I don't know whether the mathematics of probability had been discovered in Darwin's time, but even if it had, it would certainly not have been so widely known as is now the case.

It is well known that Thomas Henry Huxley questioned Darwin's wisdom in making this slow gradual cumulative process the essence of his theory and it may be that Huxley had a sort of instinctive feeling that difficulties might arise from Darwin's insistence on a long slow process. It is ironic that in later life, Darwin himself was led to observe that if, as he fully believed, the mind of man had evolved from a more elementary mind such as that of the lowest animal, then a doubt must arise as to how far his mind could be trusted in drawing so far-reaching a conclusion.

Biologists may perhaps argue that the dice-throwing analogy is too far-fetched to be accepted, but I think it is perfectly valid mathematically. If, despite the greatly enhanced improbability caused by interposing numerous unusable mutations between usuable ones, the whole process nevertheless reaches a successful conclusion, then this is surely an even greater miracle than single-step creation. It seems the evolutionists have been unconsciously beating the creationists at their own game!

In his book, *The Blind Watchmaker*, Richard Dawkins freely admits that in the history of science there have been times when the whole of orthodox science has been overthrown by a single awkward fact. Maybe the present case is just one more of those awkward facts! However, there is a saving grace in this case inasmuch as the theory of evolution could be saved by a very simple modification. I have described this fully in my book *Evolution in a New Light*, together with further arguments for its adoption and a brief outline of some of the momentous implications.

ON THE ARGUMENT FOR EVOLUTION FROM 'POOR' DESIGN

'Organisms are not random accumulations of matter but appear to be quite well attuned to their individual niches in the world. That they are "well designed" can be argued either with reference to a benevolent and omnipotent creator or to evolution by natural selection. Both referents have drawbacks, but either can serve as a rough and ready rationalization. If some aspect of an organism looks badly designed for its function, the best working hypothesis is that its function is badly understood.' (pp.49–50).

'*Apparent* poor design, as a rule, is most likely to point a finger at some serious inadequacy in our understanding of what's at issue. It's probably not nature that's poor, but rather our science.' (p. 94).

—Steven Vogel (Department of Zoology,
Duke University), Vital Circuits: On Pumps,
Pipes and the Workings of Circulatory Systems,
Oxford University Press (1992).

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